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EXPERIMENTAL STUDIES ON SOME POINTS CONNECTED WITH THE CAUSATION AND TREATMENT OF THE SUMMER DIARRHŒAS OF INFANCY.[1]

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IN order that this paper may be presented in the best form for discussion, I will state certain propositions which I conceive to be true, and after each statement will briefly give the reasons for my belief.

I. *The factor which is most frequently operative in the causation of the summer diarrhœas of children under two years of age is to be found in the food.*

It is unnecessary to take any time in discussing this proposition, since Dr. Seibert, in his paper read before this Section in February last, has presented the relation of the infantile diarrhœas to the weather in a much more practical and authoritative manner than I could. From reading the discussion which followed that paper, I think that we agree that the weather is a mediate and not a direct and exciting cause of these diseases. Heat is operative indirectly in at least two ways. *First*, a temperature of 60° F., or higher, is necessary in order that the germs of putrefaction may be disseminated to a sufficient extent to find their way into the food and drink, and into the air inhaled. Certainly such a degree of warmth is required for the fermentation of food before it is taken into the body, and there can be no doubt that the conditions which lead to the digestive disturbances which characterize these diseases have their beginnings often in the food before it is eaten. The putrefactive germs taken into the stomach frequently find the conditions for their growth improved. The temperature is the most suitable, the putrefactive products already formed are sufficient to overcome the normal antiseptic and germicide properties of the digestive juices, and the absence of oxygen favors the multiplication of the anaërobic forms of life, and to this class belong most of those microörganisms which induce disease. *Secondly*, the great heat of summer depresses the nerve-centres, and consequently lessens the amount, and may alter to some extent the quality of the secretions normal to the stomach and upper intestine. Under the influence of great heat the tissues lose their tone, and that physiological resistance which every healthy organ manifests toward toxic agents is impaired. These, I take it, are the principal offices that the heat of summer performs in increasing the infantile mortality. There is no reason for supposing that meteorological conditions have a mysterious influence in the production of these diseases. They are active only so far as they aid in the multiplication and distribution of the germs of putrefaction.

II. *The changes whereby harmful substances are formed in the food either before or after it is taken into the body are fermentative in character, or, in other words, are due to microörganisms.*

That deprivation of the mother's breast as the source of its food greatly increases the danger to the child's health and life there can be no doubt. Statistics collected in every part of the civilized world show that infantile mortality is much greater among those artificially fed than among those nursing from the breast of the mother. Why is this true? Why will not a child thrive as well when fed upon cow's milk as when it takes its nourishment directly from the breast of the mother? In answer to this question we may say that there are several reasons. There are chemical differences in the composition of the milk of woman and that of the cow. Especially is this true of the proteids. Woman's milk is much more easily digested. All of this is true, but the chemical differences in the composition of the two kinds of milk are not, I am sure, the most potent cause of the great frequency of diarrhœas among children artificially fed. This most potent cause is to be found in the fact that milk taken directly from the gland of a healthy animal, be it a woman or a cow, contains no germs of any kind whatever; while, on the other hand, cow's milk, as fed to children, always contains germs, and too frequently it contains those which interfere with the normal digestive processes, and lead to serious disease. I have taken milk directly from the lacteal ducts of the cow, and have shown that it contains no germs. The method of procedure is as follows: Some capillary glass tubes are hermetically sealed, then sterilized by heat. When ready to obtain the milk, the ends are again heated and broken off. Immediately one end of the tube is carried into the duct (the udders having been previously washed with soap and water, then with a solution of bichloride of mercury, and lastly with

[1] Read before the Pædiatric Section of the New York Academy of Medicine, May 23, 1888.

alcohol), when the tube fills with milk by capillarity. The ends are now quickly closed with sealing-wax. These tubes, kept for some days at the temperature of the body, contain no germs whatever, and consequently no decomposition occurs. Market milk, introduced into similar tubes and sealed, when kept at the proper temperature decomposes within a few hours.

Escherich[1] has made similar experiments with the milk of woman, and has found that the secretion of the mammary gland of the healthy mother contains absolutely no germs, as it comes from the ducts. In these experiments we have what is, to my mind at least, an explanation of the great prevalence of summer diarrhœas among infants fed artificially. But, says one, that explanation will not do, because sometimes, though rarely, I will admit, cholera infantum and other diarrhœas do occur among nursing infants. This is true, but these cases can be easily explained. In the first place, the healthy mother furnishes a milk free from germs, but the unhealthy mother does not always do so. Escherich found bacteria in milk taken with proper precautions from women suffering from various inflammatory diseases of the breast, endometritis, parametritis, peritonitis, septicæmia, etc. The milk from these women, kept in sterilized tubes, became strongly acid, coagulated, and was found to contain numerous microörganisms, one of which resembled very closely staphylococcus pyogenes aureus. Pure cultures of this germ injected into rabbits caused death, and, on post-mortem examination, the organism was found in the blood in the heart, and in the kidneys.

These experiments show that the milk of the mother is not always the best food for the child. But even in those cases in which the mother's milk is good there are many ways in which putrefactive and pathogenic germs may find their way into the alimentary canal of the child. Among the poor and negligent classes the exterior of the mother's breast is not always as clean as it might be. Children nurse from excoriated nipples, and sometimes from suppurating glands. Indeed, the danger to the child in taking food from diseased breasts has not been appreciated until recently by the profession. Just ten years ago I heard a very able specialist in diseases of children say that he did not know why a child's stomach could not digest pus as well as anything else.

Then there are yet many other ways in which microbes may be introduced into the child's stomach. The infant creeping about the floor must try the taste of everything in his reach, and in many tenement houses few of the articles which would fall within the grasp of the child are germ-free. You may be inclined to think that these are over-statements, but when we remember that Beumer has shown that tetanus neonatorum is, sometimes at least, due to germs growing upon the pedicle of the cord, and due to cutting of the cord with unclean instruments, or dressing it with dirty rags, we will not think it at all improbable that the child playing upon a dirty floor may feed occasionally upon microörganisms.

Lastly, there is always the possibility, and in many localities the probability, that harmful agents will be inhaled with the air, when they may find lodgement in the pharynx, and be swallowed with the food. In an epidemic of cholera infantum, which occurred in Leicester eight years ago, Johnstone found the same bacteria in the stools and in the emanations from the sewers. Indeed it is a matter of surprise, when we think of the many ways in which germs may find an introduction to the alimentary canal besides being taken directly with the food, that the mortality from the summer diarrhœas among those fed exclusively from the breast of the mother should be so small as it is shown to be by the figures of Hope, Ballard, and others. However, when the germs are contained in the food they are taken into the stomach in greater quantities than when taken in any other manner; besides they have already begun to grow in the food and their products, already formed when the food is swallowed, have more or less depressing effect upon the tissues.

That a few germs introduced into good milk may soon render it poisonous is shown by the following experiment: April 27, 1888, to a gallon of good milk I added half an ounce of poisonous milk, placed the whole in a bottle, closed with a glass stopper, and allowed it to stand at the ordinary temperature of the room for two days. Some of the milk, which had coagulated, was now filtered, the filtrate neutralized with sodium bicarbonate and extracted with ether. The residue left, after the spontaneous evaporation of the ether, was administered to a puppy and soon produced severe retching and vomiting. The gallon of fresh milk had been rendered poisonous by the activity of the microörganisms contained in the half ounce of milk which had previously begun to putrefy. I might detail to you a great number of similar experiments, but as the results have been the same in all, repetition is unnecessary and would only weary you.

On the other hand, milk which has been sterilized and kept in sterilized vessels does not undergo these changes, even when the temperature is kept at the point most favorable to putrefaction. Last December, my assistant, Mr. Novy, placed some sterilized milk in a sterilized Erlenmeyer flask, plugged the neck with sterilized cotton, and placed the flask in a Koch's vegetation trough, where it was kept most of the time at a temperature of 98° to 100° F., for three months, when an examination failed to reveal the presence of any poisonous substance.

[1] Fortschritte der Medicin, 1885.

Hofsten,[1] from a study of the records of the foundling hospital in Stockholm—which have been kept since 1812—as well as from his own experience in the same place, concludes that cholera infantum is a highly contagious disease. He is led to this belief because it has frequently been observed that the disease appears in one ward, spreads to all the inmates of that ward, and extends no further; or it attacks all those in a certain part of the ward, or is confined to those having the same nurse. To my mind, however, this does not prove that the disease is conveyed from one to another. The children in the one ward, or portion of a ward, or those of the one nurse have their food prepared, most likely, in the same way, cooked in the same vessel, brought in on the same trays, and served by the same nurses. If the nurse is not tidy, all under her care are alike endangered. The same is true if the ward is not clean, or is not properly ventilated. I think that Hofsten's facts show that the children living under the same conditions are affected by a poison emanating from a local cause, more conclusively than they support his belief that the germ is conveyed from the sick child to the well one through the air.

I have never seen anything that would lead me to suspect that the microörganisms of the summer diarrhœas are given off either from the lungs, or the skin of the sick. On the other hand, I have supposed that the germs are excreted by the bowels and probably by the kidneys, and that being suspended in the urine and moistened by the watery evacuations, they would not be disseminated through the air; but if the stools and urine should be thrown out upon the ground and the bacteria should be dried, they might then be disseminated. The reason for suspecting that the microörganism is excreted by the kidney as well as the bowels, is the frequency with which albuminuria accompanies these diarrhœas. It certainly can do no harm to have the stools and urine of patients with these diseases disinfected.

If it be true, as is held by Taube[2] and Escherich,[3] that in the young child stomachic digestion is of less importance than intestinal digestion, and that the stomach is more a receptacle into which the milk is received for coagulation than a digestive organ, then we have the most favorable conditions for the growth and activity of the bacteria which are introduced with the food. These experimenters claim that the younger the child the less active is digestion in the stomach, and that in this organ the milk is coagulated and is passed through the pylorus undigested. Hammarsten,[4] some years ago, showed that this is largely the case in the dog and rabbit.

[1] Cholera infatum på allmänna barnhuset i Stockholm, 1887.
[2] Schmidt's Jahrbücher, 1887.
[3] Jahrbuch für Kinderheilkunde, 1887.
[4] Beiträge zur Anatomie und Physiologie, 1875.

Hofmeister and Tappeiner[1] find that the stomach does not absorb soluble substances as rapidly as does the mucous membrane of the small intestine; and Zweifel has stated, and in this he is supported by Hammarsten, that the proteolytic activity of the pancreatic juice is relatively well developed in the newly born. Furthermore, it has been demonstrated by Eichhorst[2] that the intestinal mucous membrane will absorb unchanged casein. The absorption of fats is largely dependent upon the bile, and the teaching of Frerichs that the milk sugar is absorbed from the stomach, is now known to be an error. This constituent of milk is digested, as has been shown by Dastre,[3] by a ferment found in the mucus of the small intestine, and is not affected by the gastric juice. These experiments convince us that the digestion of milk is nearly, if not quite, altogether accomplished in the small intestine. These teachings of physiologists are confirmed by clinical experience with cases of intestinal indigestion in adults, for in these cases we invariably find that milk aggravates the trouble.

With these facts before us, and knowing that cow's milk begins to ferment from the very moment when it is drawn from the udder; that it is often kept for hours in unclean vessels, in foul rooms, and at a high temperature, after which it is poured, we may say, often to overflowing, into the digestive reservoir, the stomach; bearing in mind these facts, I say, Is it any longer a matter of wonder that thousands of children die every summer in this city from cholera infantum and kindred diseases?

III. *The microörganisms which produce the catarrhal or mucous diarrhœas of infancy in summer may be, and probably are, only putrefactive in character, but those which cause the choleriform or serous diarrhœa, true cholera infantum, are more than putrefactive; they are pathogenic; they produce a definite chemical poison, the absorption of which is followed by the symptoms of the disease.*

While I believe that all the summer diarrhœas of infants are bacterial in origin, I do not believe that the same bacterium is present in all. The more I observe these diseases clinically, the more I study the subject experimentally in the laboratory, the more thoroughly do I disbelieve in their unity. In the choleriform diarrhœa the symptoms come on suddenly and violently. It is true that this affection may occur as an intercurrent disease in the course of an ordinary catarrhal diarrhœa, it may be true that it is more likely to occur under these conditions than in a child previously healthy; but when it does appear in such a case the symptoms change. You are all perfectly well acquainted with these symptoms, and Dr. Smith has described them graphically and accurately. This

[1] Zeitschrift für Biologie, Bd. 16.
[2] Pflüger's Archiv, Bd. 4, 1871. [3] Comptes Rendu, t. 96, 1883.

disease differs from the catarrhal diarrhœas of infancy in symptomatology and in pathology, and there are reasons for the belief that there is also a difference in etiology, and if we accept the germ theory for these diseases we must believe either that the germs causing them are different, or that the same microorganism will produce in one child a well-marked train of symptoms and characteristic anatomical alterations, and in another wholly different effects and lesions. The poison of choleriform diarrhœa acts immediately on the nervous system, most probably having its chief effect upon the sympathetic nervous system; the most pronounced early effect of the poison of catarrhal diarrhœa is as a local irritant.

It now devolves upon the bacteriologist to isolate the microörganisms present in the various forms of summer diarrhœa, and upon the chemist to study the putrefactive products of these germs as they are grown in various media. There has already been considerable activity in this line of work among bacteriologists, but until the appearance of the monograph of Escherich,[1] a little more than a year ago, we knew nothing positively or accurately concerning the normal bacterial vegetation in the intestines and stools of infants, nor of the effects of alterations in the food of the child upon these growths. Escherich has done his work so thoroughly that it will serve as a basis from which the pathological organisms may be studied, and we hope for some good results in the near future.

Hayem,[2] and his pupil Lasage, claim to have discovered and isolated the microörganism of "green diarrhœa." They also state that they have found in lactic acid a sure germicide in the treatment of this form of summer diarrhœa. However, it has not yet been demonstrated that the "bacillus of green diarrhœa," as the germ is called, has any causal relation to the disease, and the statement that the administration of seven or eight grains of lactic acid per day will cure a disease which is characterized by the great extent to which the lactic acid fermentation goes on in the intestine will require repeated corroboration before it is generally credited.

IV. *The bacteria which produce these diseases prove harmful by splitting up complex molecules and forming chemical poisons.*

The answer to the question, How do germs cause disease? has now, thanks to the labors of Selmi, Brieger, Hoffa, and others, been satisfactorily answered. They do so by elaborating chemical poisons, some of which are powerful in action, are rapidly absorbed, and manifest their effects upon the central nervous system, as in Asiatic cholera, and, as I believe, in the choleriform diarrhœa of infancy; others are less powerful and act primarily as local irritants, inflaming the tissues and leading to necrotic changes, as is most likely the case in the catarrhal diarrhœas of infancy. We now expect to find for each infectious disease its specific microörganism, which produces its own characteristic ptomaine. The ptomaines of tetanus, anthrax, and typhoid fever have been isolated, and I think that in tyrotoxicon we have the chemical poison or ptomaine of genuine cholera infantum. This substance is rapidly formed in milk when the germ is present and the conditions are favorable for its growth. Newton and Wallace, in investigating the outbreak of milk-poisoning at Long Branch in August, 1886, found that the milk drawn from the cows at noon became sufficiently poisonous within six hours to affect seriously those who partook of it; they also found that the toxic agent in the milk was tyrotoxicon. The microorganism which produces this ptomaine has not yet been isolated, but we know that the production of this poison is due to the action of a ferment, because a small quantity of poisonous cheese, cream, or milk added to good milk will soon render the whole poisonous, if it be kept at the proper temperature. While this germ has not been identified, we know something of its nature and growth. It does not develop below 60° F., and it is anaërobic.

The symptoms produced by this poison are very similar, if not identical with those observed in the choleriform diarrhœa of children. There is a sensation of constriction or burning in the throat, retching, vomiting, and frequent watery discharges, the first two or three of which may contain fecal matter, but the subsequent ones are serous, without fecal odor, and alkaline in reaction. When too large doses are not given and collapse does not come on speedily, there may be an elevation of temperature, but when the heart becomes very weak, the temperature may be subnormal. With very large doses, one grain or more, full-grown cats may be killed within thirty minutes. In these cases there is the most violent retching, but neither vomiting nor stool. After death the lungs are found congested, the circular fibres of the intestine are in places tightly contracted, and the stomach is generally free from any redness. By the continued administration of very small doses the vomiting and diarrhœa are kept up; the animal is unable to retain any food, loses flesh and dies from exhaustion, usually immediately after a severe attack of retching or vomiting.

I deem it unnecessary to detail here experiments illustrating the effects of this poison, as I have done this elsewhere. Moreover, this ptomaine has been obtained, and its effects described, by Newton, Wallace, Schearer, Wolff, Firth, and others.

In a condensed form, the following are the reasons for believing that tyrotoxicon is the exciting cause, in at least some instances, of choleriform diarrhœa in infants.

(*a*) This ptomaine results from the putrefaction

[1] Darmbakterien, 1886. [2] France Médicale, 59, 712.

or bacterial fermentation of milk. The disease is confined (with very few exceptions, which are easily explained) to children fed upon cow's milk, and is most prevalent among those classes which use milk most likely to be subjected to conditions which favor putrefactive decomposition.

[I would not have it understood from the above that tyrotoxicon is formed whenever milk ferments. It certainly is not produced in the ordinary souring of milk by the lactic acid ferment, as I have repeatedly shown by experiment.]

(*b*) Tyrotoxicon has been found in the milk given to a child immediately before the appearance of the symptoms of choleriform diarrhœa.[1]

My colleague, Dr. C. George, has reported to me an interesting case, which I must mention in brief here. He was called in great haste, on a very hot day, to see twins a few months old, who were reported as vomiting and purging for some hours. On his arrival he found one dead and the other suffering from symptoms which he immediately pronounced cholera infantum. He called for the milk upon which the children had been fed, and not liking the taste of it, he told the mother it had not been properly kept. She resented this, and in order to show that the milk was good, she drank a full tumbler of it. In a short time she also was vomiting and purging.

(*c*) The symptoms of the disease increase if the administration of milk is continued, and abate when milk is withdrawn from the food.

For the demonstration of the truth of this statement, Drs. Jacobi, Holt, and others, have given abundant testimony.

(*d*) The symptoms induced by the poison and those observed in the disease are identical.

(*e*) The post-mortem appearances are identical in the two cases.

Tyrotoxicon may be produced either outside or inside the body. The germ taken into the stomach of the child with milk finds present the two conditions which we know to be necessary to its growth, a proper temperature and the absence of free oxygen. That some of the anaërobic germs which occasion putrefactive changes in milk, do grow and multiply in the stomach, is demonstrated by the not infrequent presence of the butyric acid ferment in the vomited matters in certain cases of indigestion.

While I am thoroughly convinced that the catarrhal diarrhœas of infancy are bacterial in their origin, and that these bacteria produce chemical poisons or irritants, I feel certain that both the bacteria and ptomaines are different from those causing the choleriform diarrhœa. In the needed investigations concerning the causation of these diseases, there is a rich field of promise for both the bacteriologist and the chemist.

[1] THE MEDICAL NEWS, vol. l. p. 675.

V. *The most efficient preventive treatment of the summer diarrhœas will consist in giving more attention to the food, methods of feeding, and to the sanitary surroundings of children during the first two years of their lives.*

I do not propose at this time to go into an exhaustive discussion of infant feeding, but there are a few points inseparably connected with the matter in hand which must be touched upon at least. I cannot agree with Wegscheider,[1] who holds that the proteids of woman's milk are fit for absorption without the action of any digestive juice, but there can be no denial of the fact, of which we have so many proofs, both physiological and clinical, that the infant digests the milk of the mother or healthy wet-nurse more readily than it does cow's milk. Nor must the large amount of nitrogenous substances in the stools of breast-fed children mislead us into the belief that these are altogether portions of undigested milk. The nitrogen-containing substances in the normal stools consist largely of the secretions, or rather excretions, from the intestine. With the fats it is otherwise. It must be acknowledged that woman's milk usually contains more fat than can be utilized by the child. The amount of fat in the normal stool varies from eight or nine to more than fifty per cent. of the dry substance. Unchanged milk-sugar does not appear in the normal feces of breast-fed infants. This does not necessarily mean, however, that all of this food stuff has been absorbed, for the products of the decomposition of milk-sugar do occur in the excretions from the bowels.

Escherich has shown that a healthy child of ten weeks of age will take about one quart of undiluted cow's milk per day, while an equally well-nourished child of the same age, taking its nourishment from the breast, receives in the same time about 774 grams of milk. The first child receives 34.64 grams of proteid, and the second only 12.93 grams of the same food stuff. We thus see that the proteolytic activity of the digestive organs of the artificially fed child must be severely taxed, or a large portion of the proteids must wholly escape digestion. That no large amount of the proteid does escape change of some kind, is shown by the experiments of Forster and Uffelmann, which demonstrate that in the normal stool of the child fed upon cow's milk, only about one and five-tenths per cent. of the casein appears unchanged. This also does not show that all the casein is digested. How much of it is altered by the agency of bacteria we do not know.

Children fed upon cow's milk are more likely to be over-fed than those nursing from the breast, for two reasons. In the first place, the supply is not so easily exhausted; and, in the second place, the child obtains the food more easily, indeed, the milk is

[1] Die Normal Verdauung der Saunglings, 1876.

often poured into the child's stomach *ad nauseam*. To these might be added the fact that the child is often supplied with the nursing bottle when the busy mother would not stop her work to nurse it herself. Still, again, the system needs about so much water, and too many mothers and nurses forget that a little water might be relished at times even by a babe. This overloading of the child's stomach with proteids greatly increases the chances of digestive disturbances arising from putrefaction. Granting that all of the proteid, which is altered in the alimentary canal, is really digested and absorbed, still the excess is not needed, cannot be utilized by assimilation, and must do harm. Some one has said that "we live upon what we eat;" Meinert, I believe, has changed this, and said "we live upon what we digest;" I should beg to make another alteration, and say, "we live upon what we assimilate." Overfeeding, even when followed by complete digestion, can do only harm.

But supposing that the excess of proteids in the cow's milk is avoided by dilution with water, there still remain the differences in the chemical composition of the two kinds of milk, and the greater probability that the cow's milk is contaminated with dangerous bacteria.

Simon[1] found that the mucous membrane of the stomach of a child, which died soon after birth, readily coagulated woman's milk, but was without effect upon cow's milk. The same investigator found that after complete desiccation the casein of woman's milk is freely soluble in water. Bouchardat, Quevenne,[2] Meggenhofen,[3] and others, state that the casein of woman's milk forms soluble compounds with small amounts of acids, while the casein of cow's milk is coagulated by the same. Radenhausen[4] claims that there is no real casein in the milk of woman, and that the proteids exist as albumen, protalbumen, and peptone. Struve[5] finds in woman's milk about one-sixth as much insoluble casein, twice as much soluble casein, nearly three times as much albumen, and one-third more peptone than in cow's milk. Other chemists of equal reputation might be quoted, but while there are many minor differences, all agree substantially that the proteids of the milk of woman are more easily digested than are those of the milk of the cow.

I can see no reason why the casein of cow's milk should not be partially digested, partly converted into the soluble form at least, when used in the feeding of infants, especially with those of feeble digestion. However, I would object to complete artificial digestion for several reasons. In the first place the digestive organs, like all other organs of the body, would be enfeebled if relieved of their physiological duties. In the second place the too rapid absorption of peptones is harmful. Albertoni, of Genoa, and Schmidt-Mulheim, have independently shown that if peptones be injected directly into the blood, they are poisonous. Normally, it is a function of the liver to arrest and alter the products of proteid digestion in the stomach and intestine, but if a great quantity of ready-made peptones be poured into the stomach, they will be absorbed so rapidly that the liver may fail to perform this function fully. The feeding of completely digested food may be admissible for a time, in rare cases, where there is great debility, but its long continuance is irrational and unscientific. Certainly it is not the thing to do for healthy children. Again, Brieger has shown that artificial digestion of proteids is accompanied by the production of a poisonous base, which he has named peptotoxin. Whether this substance is formed in normal digestion or not, we cannot say. If so, it must be altered or eliminated by the liver.

As to the addition of some carbohydrate to cow's milk, I agree with Dr. Smith, that dextrin is the best form. I will not take the time to give my reasons for this at present.

In order to protect the child, as far as possible, from the harmful microörganisms which may be present in cow's milk, the greatest attention should be given to the care of this food. I have elsewhere given some rules for the handling of milk, and I have not seen any reason for changing them.[1]

As to the sanitary surroundings of the child in their influence in the production of summer diarrhœas, it is unneccessary for me to say anything to you. I only mention this point to show that I do not ignore it, and would not omit from the list of things to be done in the prevention of these diseases improvement in the sanitary conditions of dwellings and their surroundings.

I will now proceed to my last proposition.

VI. *In the curative treatment of the summer diarrhœas of infancy, the destruction of the bacteria which are causing the abnormal fermentation is a necessity.*

The truth of this statement will be admitted, I think by all, and a detailed discussion of it here would be out of place. I will only refer to the methods of destroying these germs in brief.

One of the surest methods of destroying the life of any plant or animal is to withdraw all the sources of food supply. Germs in the intestine of the child may be destroyed in this way. If they feed upon the constituents of milk, stop the administration of milk. Escherich[2] has shown by actual demonstra-

[1] Die Frauenmilch nach ihrem chemischen und physiologischen, Verhalten, Berlin, 1838.
[2] Du lait, Paris, 1857.
[3] Diss. inaug. sistens indigationen lactis muliebris chemicam, Frankfort, 1826.
[4] Zeitschrift für physiologische chemie, B. 5, S. 13.
[5] Journal für practische chemie, B. 27, S. 249.

[1] THE MEDICAL NEWS, vol. 50, p. 674. [2] Darmbakterien.

tion, that the bacteria normally present in the stools and intestines of the young fed upon milk disappear wholly and speedily when the administration of milk is stopped and a meat diet is substituted. A radical change in diet is one of the most certain methods of changing the nature of the bacteria which cause certain digestive disturbances. The struggle for existence is probably not without its effect even upon microörganisms. Some thrive abundantly in a given medium—indeed, they multiply so rapidly in many instances that they crowd other germs out of existence—but when the medium in which they exist is changed they find that the new conditions of life influence their rate of growth and reproduction, and if these new conditions are unfavorable to the old resident, he is displaced by an invader. Again, although the old germ may grow and multiply in the new medium, it may lose its virulence, it may no longer be able to elaborate the chemical poison or ptomaine, the production of which characterized bacterial activity in the first medium. Thus, Brieger has shown that the typhoid bacillus will grow and multiply, but will produce no typhotoxine, in solutions of peptone, while in beef-tea preparations it does produce this poison. As I have already stated, a small quantity of milk containing tyrotoxicon added to any quantity of good milk will soon render the whole poisonous; but, when added to beef-tea, or solution of egg-albumen, the amount of the chemical poison is not increased.

This I have found to be invariably the case in a large number of experiments which I have made, and it indicates either that the meat and albumen preparations will not support the life of the tyrotoxicon-producing germ, or that in these media the conditions of the life of the germ are so altered that it no longer produces a chemical poison.

We have labored to show that the bacteria which cause the summer diarrhœas of infancy find in milk the most favorable conditions for their growth, activity, and reproduction, therefore, when we wish to destroy these bacteria we certainly shall not continue to feed them upon milk. The prompt and complete withdrawal of all milk, of every kind of milk, even that of the mother, in the treatment of the summer diarrhœas of infancy, has been advocated for many years by eminent clinical teachers, and now the chemist and bacteriologist have shown that this recommendation is a good one, and have given a scientific explanation of it.

The withdrawal of all milk food should be the first step taken in the treatment of the summer diarrhœas of infancy, then other means may also be resorted to in order to hasten the destruction of the agents of the harmful fermentation. Epstein[1] stops the use of milk, washes out the stomach, sometimes employing an antiseptic wash, gives solutions of albumen as food and germicides as medicine. Holt[1] and others recommend cleansing the alimentary canal with a free dose of castor oil in the early stages. Washing out the large intestine is, also, sometimes resorted to.

I have made a few experiments in order to ascertain the value of certain germicides in the destruction of the germ which generates tyrotoxicon. Two ounce bottles were filled with milk, milk and ferment, and milk, ferment and some germicide, closed with glass stoppers, and kept in an air-bath at the temperature of the body for twenty-four hours, and the contents of the bottles were then tested for tyrotoxicon with the following results:

No. 1. Pure milk; no poison.

No. 2. Pure milk; no poison.

No. 3. Milk and ferment; poison in quantity.

No. 4. Milk and ferment; poison in quantity.

No. 5. Milk and ferment and one hundredth grain mercuric chloride; poison present.

No. 6. Same as No. 5.

No. 7. Milk and ferment and one twenty-fifth grain of mercuric chloride; no trace of the poison.

No. 8. Same as No. 7.

No. 9. Milk, ferment, and five grains of naphthaline; poison present in as great quantity apparently as in the bottles containing milk and ferment only.

No. 10. Same as No. 9.

No. 11. Milk, ferment, and five grains of sodium salicylate; poison not present.

No. 12. Same as No. 11.

No. 13. Milk, ferment, and five grains of resorcin; poison not present.

No. 14. Same as No. 13.

It seems from these experiments that 1 part of mercuric chloride to 24,000 parts of milk is sufficient to prevent the activity of the tyrotoxicon-producing germ, while 1 part of naphthaline to about 200 parts of milk is wholly without effect. This is not the first time that naphthaline has been found wanting. Seitz[2] found it without effect on the typhoid bacillus.

The sodium salicylate and resorcin were efficient in proportion of 1 part to about 200. In less quantities they were not, as was shown by some further experiments. There has been some dispute about the germicide properties of combined salicylic acid, Bucholtz standing almost alone in claiming for it such properties. He found sodium salicylate, when present to the extent of 0.4 per cent., preventing the development of bacteria; and it will be seen that in my experiments it was present to the extent of 0.5 per cent. However, I cannot be sure that it acted as sodium salicylate; it may have been partially or

[1] Jahrbuch für Kinderheilkunde, 1887.

[1] New York Medical Journal, 1887.

[2] Die Ætiologische Bedeutung des Typhusbacillus, 1887.

even wholly decomposed by the traces of free lactic acid present.

The germicide value of resorcin is generally understood. Ehrig[1] has used a 1.5 per cent. solution of this substance in washing out the stomach in cholera infantum, but in two cases in which a little of the solution was left in the stomach, serious symptoms, accompanied by bloody urine, followed.

GUNSHOT WOUND OF THE ABDOMEN.

PERFORATION DIAGNOSTICATED BY RECTAL INSUFFLATION OF HYDROGEN GAS; LAPAROTOMY; DEATH FROM SEPTIC PERITONITIS.

BY WILLIAM MACKIE, M.A., M.D.,
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VIEWED from a diagnostic standpoint, the following case is of the greatest interest. Occurring in the human subject, it confirms the infallibility of rectal insufflation of hydrogen gas as a diagnostic measure for the detection of visceral injuries of the gastro-intestinal canal in penetrating wounds of the abdomen. This was first proposed by Professor Senn (with whom I have been associated in his experimental researches), and demonstrated by him in animals before the Surgical Section of the American Medical Association, at the meeting held in Cincinnati, in May, 1888.

C. D., colored, aged twenty-seven, admitted into Milwaukee Hospital, May 11, 1888, at 11 P. M., for pistolshot (38 calibre) wound of abdomen, inflicted two hours previously. The symptoms present were: copious vomiting prior to admission, vomit tinged with blood, excruciating pain referred to umbilical region, abdomen flat on percussion from level of umbilicus to pubes; abdominal wall rigid, liver dulness normal, shock not marked. The wound of entrance was situated two inches to the left of the linea alba, and one inch below the costal arch; that of exit, in the left lumbar region close to the spine, and one inch above the iliac crest; general direction of bullet from above, downward and backward. The bullet had been removed from underneath the skin before he was brought into the hospital.

The patient was etherized, and rectal insufflation effected in the following manner: A four-gallon rubber bag, filled with hydrogen gas, was connected by rubber tubing with the long glass tube of an extemporized chemical wash-bottle, half filled with water. To the short glass tube, passing through the cork only, was attached, by rubber tubing, the rectal nozzle of an enema syringe. This bottle was introduced so that the rapidity of inflation could be judged of by the bubbling of the gas through the water. When the rectal nozzle had been introduced, slow, steady, and continuous pressure was made on the rubber bag. Under very slight pressure the gas commenced to bubble through the water. As inflation progressed, the abdomen, previously flat on percussion from the umbilicus to pubes, became resonant, and the area of liver dulness diminished from below upward. The inflation was continued until the abdomen became uniformly distended and tympanitic throughout. Still no gas escaped through the wound of entrance, although kept at the highest level. On firmly compressing the abdomen, there occurred an intermittent escape of gas mixed with blood through the wound of entrance. To demonstrate the presence of hydrogen by ignition of the escaping gas, matches were employed. These proved very unsatisfactory, for a burning match never once happened to be directly over the wound of entrance when the gas was escaping. The taper as used by Senn in his experiments had, in the hurry of preparation, been overlooked. The escape of gas from the wound of entrance positively proved that the gastro-intestinal canal had been injured, so that further attempts at ignition were superfluous.

Laparotomy by median incision.—When the peritoneal cavity was opened, the omentum immediately bulged into the incision, and, through its translucent structure, it was distinctly seen that it was lifted from the subjacent intestines by the gas which had escaped through the perforations into the peritoneal cavity. From a puncture made in it gas escaped; still the abdomen remained uniformly distended. As the incision was enlarged the transverse colon, greatly distended, escaped; followed by the small intestine, uniformly distended. Examination showed that the intra-abdominal hemorrhage was profuse, originating from the superior mesenteric vein at the root of the mesentery. This was arrested by ligation of the distal and proximal ends.

The distended condition of the colon and small intestine, coupled with the position of wound of entrance, indicated that the perforations must be situated high up; therefore the search was commenced at the stomach. The stomach was empty, and in it were found two perforations; one on the anterior and the other on the posterior surface near the cardiac end, and close to the omental attachment. The duodenum was free from gas, and, at the junction of the duodenum and jejunum, two perforations on the lateral aspect of the intestine were found. For some distance beyond these the small intestine did not contain gas; but as no perforations were found before the distended intestine was reached, I concluded that no more perforations could exist. Examination of the small intestine, while replacing, confirmed this belief. These perforations were closed by a continuous Lembert silk suture. There was no extravasation of stomach or intestinal contents. The other injuries found were one perforation of the transverse meso-colon and two of the mesentery. Patient died of septic peritonitis thirty-six hours after the receipt of the injury.

Post-mortem six hours after death.—(Prof. Senn present.) The sutures were removed from the abdominal wound which had not united, and rectal insufflation of hydrogen gas made to test the integrity of the gastro-intestinal canal. Very slight pressure was required to overcome the ileo-cæcal valve, for compression of the rubber storage-bag had hardly been commenced when the small intestine,

[1] Jahrbuch für Kinderheilkunde, 1887.

previously flaccid, began to distend and escape through the abdominal incision. Its further escape being prevented, the gas was forced through the entire gastro-intestinal canal. The abdomen was now opened by the usual post-mortem incision. The peritoneal cavity presented the appearances of diffuse peritonitis, most marked in the region of the stomach. The sutured perforations, securely closed, were found. With the intestines *in situ*, alternate compression of the cæcum and ileum produced a to-and-fro movement of the gas through the ileo-cæcal opening. This was in every instance accompanied by a distinctly audible blowing, gurgling sound, such as Prof. Senn has described as present on auscultating the ileo-cæcal region in his experiments on the human subject. Further examination revealed a slight, contused and lacerated bullet wound in the tail of the pancreas, and hemorrhagic infiltration of the retro-peritoneal connective tissue below the kidney, and corresponding to the wound in the posterior abdominal wall. About one pint of sero-sanguinolent fluid was found in the peritoneal cavity.

REMARKS. — It was impossible to diagnosticate, from the symptoms, perforation of the gastro-intestinal canal. The position of the wound of entrance and the character of the vomit were presumptive of injury to the stomach. The normal area of liver dulness was opposed to the presence of intestinal gas in the peritoneal cavity. That no gas escaped at the time of injury into the peritoneal cavity, is to be inferred from the diminution of the area of liver dulness following insufflation, and the escape of gas on puncture of the omentum. The general direction of the bullet, and the position of the wound of exit pointed to injury of the descending colon or kidney; still both were intact. The symptoms of intra-abdominal hemorrhage were not so marked as to justify a laparotomy.

The escape of gas from the wound of entrance, after rectal insufflation of hydrogen gas, afforded positive evidence of perforation existing somewhere in the gastro-intestinal canal, and on this evidence alone was laparotomy performed. The perforations were so situated as to put this diagnostic measure to the severest test. It was found reliable, and further experience will prove that it is as infallible in the human subject as Senn has found it in animals. It never once failed.

In conclusion, we come to the medico-legal aspect of this case. The man who did the shooting has been committed for trial. The symptoms present were only presumptive of the existence of perforation, until rectal insufflation was made. Had an exploratory laparotomy been performed with the above fatal result, and no intra-abdominal lesions, sufficient to warrant such a grave operation, been found, the position of the surgeon would have been very embarrassing. The defense might affirm that the surgeon ought to be held responsible for the patient's death, and not the defendant. Naturally, this would deter one from operating; but if the surgeon can demonstrate by rectal insufflation of hydrogen gas, the presence of diffuse tympanites due to escape of gas through a perforation into the peritoneal cavity, even without the escape of gas through the external wound, he may rest assured that perforation exists somewhere in the gastro-intestinal canal, and he can then safely proceed to the necessary operative treatment without incurring any medico-legal responsibility.

ON THE USE OF HYDROGEN GAS TO DETERMINE THE SITE OF A FECAL FISTULA—WHETHER IN THE LARGE OR SMALL INTESTINE.

BY WILLIAM J. TAYLOR, M.D.,
OF PHILADELPHIA.

IN a case at present in the surgical ward of St. Agnes's Hospital, in the service of Dr. W. W. Keen, Dr. Sprissler, one of the resident physicians, suggested the use of hydrogen gas, as recommended by Dr. Senn in THE MEDICAL NEWS of May 16, 1888, in order to determine the site of a perforation of the bowel, whether in the large or small intestine. A brief account of the case will, I trust, prove of some interest to the profession in connection with this novel subject.

The patient had a fecal fistula on the left side of the abdomen. The question as to whether a lateral or a median incision should be made depended upon whether the proximal opening was in the large or the small intestine. The distal opening threw no light upon this point. In order to determine the question, inflation of the bowel by hydrogen gas was used by Dr. Keen, since if the gas escaped by the fecal fistula before any gurgling occurred in the ileo-cæcal valve, it would prove that the opening was in the large intestine; if, however, the gurgling sound was heard as the gas passed through the ileo-cæcal valve, prior to its escape from the fistulous opening, it would be proof that the opening was in the small intestine.

Accordingly, a gallon of hydrogen was procured in a rubber bag, to which was attached the nozzle of an ordinary Davidson syringe. On inserting this into the rectum, and with a moderate pressure by the hand on the bag, in less than half a minute, and after the use of not over one-third of the amount of hydrogen, and before any gurgling was heard at the ileo-cæcal valve, gas was seen to bubble out from the fecal opening, and on bringing a lighted candle near it, it took fire. The mode of its taking fire was worthy of notice. The day was clear, and the sun shone brightly, so that the flame was scarcely visible, but the gas took fire with a slight explosive snap, which was perfectly characteristic and easily perceived.

A small exploratory opening was then made in the belly-wall only, and the fecal fistula was found

to arise from a carcinoma in the large bowel, and as the disease had progressed, evidently, far beyond operative relief it was considered advisable to desist from further operation.

DIPHTHERITIC PARALYSIS.[1]

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OWING to its practical importance, I beg leave, before entering on the consideration of diphtheritic paralysis, briefly to refer to a subject which is naturally suggested by it, namely, the post-latent stage, as I would term it, of the acute infectious diseases. To the antecedent latent stage of these diseases, which intervenes between the reception of the infection into the body and the first manifestations of its activity, we have the term incubation applied. Upon this follows the stage of development which is described in our text-books in its symptoms and course, until the clinical picture ends with what is called the termination in recovery. That termination is taken for granted to coincide with the subsidence and disappearance of all the characteristic external signs of the disease itself, and with the restoration of the different bodily functions which have been disordered to their normal state. That another latent stage of the disease should follow upon the stage of development, specific to each disease in its characters, of equally specific processes and duration, is hardly ever suggested, and yet I have long thought that this is the case in each of the acute infectious diseases, so that a post-latent period must not only be predicated of them as necessary to their real course and always preceding true final recovery, but that in each the effects of the specific latent processes are often of as much practical importance so far as providing for them in the treatment of the patient is concerned, as any of the outward manifestations of the period of development itself. If this be true, then when certain disorders arise during the so-called convalescence of the patient, instead of regarding them as sequelæ, and, therefore, of a more or less accidental character, they should be regarded as much parts of the original disease as the eruption of an exanthem is so regarded and described. Thus we ought not to call scarlatinous nephritis a sequel of scarlet fever, for we have no right to forget that the child still has scarlatina and the kidneys are yet to be heard from, though the patient may have returned to play for two weeks after his apparently mild and temporary first illness.

The frequent severity also of many of these so-called sequelæ in comparison with the light symptoms of the stage of development, ought to suggest the surmise that instead of having only traces or after-effects in hand we have the original complaint itself yet in all its power, and that in these cases its most active workings are during the third, and not during the second period of the natural history of the disease. The seasonal character of many epidemics in this respect, such as the greater liability to nephritis in scarlatina in some years than in others, is but another confirmation that nephritis is as much a part of the disease as the eruption itself, and yet in all its characters it is as much a post-latent stage symptom, and proving therefore, that there is a post-latent stage, as the eruption is a symptom of the stage which succeeds that of incubation. The same may be said of the so-called relapses of typhoid fever; what they in fact indicate is that typhoid fever does not cease when the fever ceases, just as scarlet fever does not; it is really a longer disease than the thermometer measures, and bears in this a resemblance to ague. On the same grounds, I suspect that measles has a post-latent stage in the bronchial tubes, with a continuous process of alteration of the bronchial epithelium going on for some weeks, as specific as its cutaneous eruption is, and that some instances of true sequelæ, such as a life-long asthma, might have been prevented had the significance of the persistent bronchitis been understood as meaning that measles was yet there, rather than that we only had a complication of measles to deal with. Another manifestation of the post-latent stage of measles may be found in the ears, and that this is not a simple local accident, but due to a still present influence of the original disorder in the whole system, may be shown by an unexpected endocarditis, often as insidious and as apt to be overlooked as the otitis itself. The same may be said of such generally trivial disorders in their development stage as mumps and suppurative tonsillitis; after either of these complaints the ears should be watched in the one case and the urine in the other, for the hyperacidity of the latter is often the precursor of acute articular rheumatism. It is doubtful whether any case of ague, with only a single chill as its outward manifestation, can be truly cured under six weeks, as a record of the periodical daily changes in the urine will show. In fact, what we wish to maintain by these remarks is, that all diseases which depend upon an infection of the system by a self-multiplying agent are divisible in their life-history in the body into three stages, namely: 1. The pre-latent or incubative period; 2. The development or manifestation period; and 3. The post-latent period, which latter is not a sequel of the preceding two, but a necessary and integral stage of the whole process, with its own specific characters, and, therefore, its own specific dangers, probably in some cases, as we

[1] Read before the Neurological Section, New York Academy of Medicine, May 15, 1888.

shall mention further on, dependent upon the addition of new special elements in the morbid process.

Diphtheritic paralysis, therefore, is not by any means an isolated case of an infective disease apparently, but only apparently, getting well, because after all signs of it have disappeared, it may be for weeks, yet the patient suddenly presents symptoms of a formidable kind in his nervous system. The intensity of these symptoms also in many cases so much exceeds the preceding signs of diphtheria that I have had several patients brought to me in which no such antecedent was suspected. It is hence a post-latent stage development, for it rarely manifests itself till the second week after the ordinary course of the disease, in most cases not coming on till the third week, and in many not till the fourth week or even longer.

Diphtheritic paralysis is distinguished by the separate rather than the progressive character of its manifestations. Thus it often happens that while it is invading new tracts of nervous distribution it is leaving those which it has first visited, paralysis of the lower extremities, for example, coming on while the pharyngeal and laryngeal symptoms are rapidly improving. This superficial semblance with hysteria ends there, for, as will soon appear, no disease has less of the characters of the functional and more those of the organic paralyses than it manifests. On the other hand, in contrast with organic paralyses, it begins generally with just those signs with which the worst organic forms end—namely, with apparently bulbar symptoms. For a long time the early implication of the palate and pharynx was incorrectly ascribed to the local influence of the antecedent exudation in the throat, but this view is negatived not only by the fact that the paralysis bears no special relation to the extent or duration of the previous angina, but also by the fact that paralysis of the palate and dysphagia are the most common paretic symptoms in those patients where the original seat of the disease was not in the throat at all, but in some other part of the body. It would be difficult to cite a more complete palsy than the palate shows in some typical cases. It does not move from its passive pendant state during respiration, phonation, or deglutition, and as one of its chief functions is to close the posterior nares against fluids during deglutition, one of the first signs of diphtheritic paralysis appears in drinking. It is not only motionless, but also more generally insensitive to all impressions, including electrical excitation, than in this disease elsewhere. The voice is very differently affected in different patients with apparently the same degree of palatine paralysis. If it exists alone a nasal twang is most noticeable; but in one case of my own the vowel sounds were so much altered that the larynx was examined and coincident paralysis of the left vocal cord was found. In this case the superior laryngeal nerve, whose motor filaments supply the muscles of the epiglottis, was not involved at all, the epiglottis being in its normal position and normally sensitive; so that though the patient had extreme dysphagia, yet he never had an attack of choking.

As our present object, however, is not so much to enumerate the varied clinical manifestations of diphtheritic paralysis as to discuss its nature, we may remark here that the coincidence of motor and sensory paralysis in limited localities which are yet supplied from both sides of the brain and cord, would indicate that the lesion was peripheric and not central. It is true that we often have only a motor or only a sensory local paralysis in diphtheria, but in the palate it is frequently the reverse, both arches are equally relaxed and equally insensitive. The significance of this fact was overlooked on account of the wrong interpretation that we had here an example of a general deadening of the part by a specific local inflammation. The same palatine paralysis, however, occurring after a diphtheritic conjunctivitis, for example, ought to have suggested that a morbid process involving the peripheric nerves and not the nerve centres was the true explanation of the condition. On the other hand, some of the features of the next most common manifestation of diphtheritic paralysis, namely, that of the power of accommodation in the eye, are rather puzzling to explain on the hypothesis of peripheric rather than centric origin. The patients lose the ability to distinguish near objects and become farsighted or presbyopic. Hence, in myopics the disorder is not so easily recognizable. But meantime the light reflex of the iris remains almost invariably intact, and, as in other examples of ophthalmoplegia interna, the loss of accommodation with preservation of the light reflex is a sign of a central lesion, it seems to be difficult to explain diphtheritic cycloplegia as due to a local affection of the ciliary muscle, except that in other paralyses of the third nerve, not diphtheritic, it is rare to find one limited to the ciliary branch alone. It is curious also that the power of contracting the pupil in efforts at accommodation is sometimes preserved and sometimes absent after diphtheria. In about half the cases of palatine palsy the limbs become in time involved, and the legs before and more extensively than the arms. The leg movements are quite unlike those of spinal paraplegia, and instead of being stiff and spreading are more like those of hysterical paralysis in dropping heavily to the floor. Less frequent are paralyses of the laryngeal muscles, those supplied by the superior laryngeal nerve being oftener involved than those of the vocal cords. In such cases the epiglottis remains open, inert, and insensitive, and the danger of choking is very great. Paralyses of the muscles of the neck and of the trunk, so generally

spared in hemiplegia, are often so pronounced that the head cannot be held up nor the trunk balanced or moved. In a few, and necessarily dangerous cases, the intercostal muscles and the diaphragm become affected and respiration greatly impeded. In other instances, the muscles of the eyeball, most commonly the external recti, are implicated, and Gowers mentions a case of complete ophthalmoplegia externa affecting both eyes with bilateral ptosis. Sensory paralyses, on the other hand, are just as varied, and seem to bear no relation to the motor disturbances. Thus, Owen of London (*Lancet* of April 2, 1887), reports a case of severe paralysis of deglutition, then of the intercostals, and then complete paralysis of the diaphragm with great weakness of the heart, and finally on the forty-fourth day paralysis of the left external rectus and of some facial muscles. The patient recovered, but throughout there was no alteration of the cutaneous sensibility or any other sensory symptom. On the other hand, in a patient of my own there was a very annoying persistence of symmetrical paræsthesia for six weeks in the soles of the feet with singular sensations following any tactile impressions made on the dorsum, but without any true anæsthesia or analgesia, and no motor weakness whatever. It is significant, however, that when anæsthesia develops in the limbs it is much more pronounced as we approach the extremities, being greatest in the toes and in the tip of the fingers. Of the special senses, hearing is exempt, but both taste and smell, as might be expected from their palatine associations, are sometimes affected. The limitation of the field of vision in some cases which have paralysis of accommodation, has, doubtless, some relation to that disability, for the optic nerve itself almost invariably escapes. It is, however, very probable that the muscular sensory nerves are sometimes involved, even though the cutaneous sensory nerves escape, for diphtheritic ataxia, especially of the lower limbs, often so closely resembles locomotor ataxia that it might be easily confounded with it, but for the history of the case, and the absence of certain symptoms which we now proceed to mention.

The exemptions of diphtheritic paralysis are quite noticeable and peculiar. Besides the nerves of hearing and of sight just mentioned, we have a striking exemption of the vasomotor and trophic nerves. The skin of the paralyzed parts is neither glossy nor œdematous, nor mottled, nor the seat of ulcerations or eruptions. Occasionally we have a more or less transient atrophy of some muscles, as we might expect from some anatomical lesions to be mentioned, but the rule is that trophic changes are conspicuous by their absence. The electrical reactions are sometimes unchanged, oftener, however, when the motor disturbances have been prolonged, faradic excitability is much diminished or lost, and the muscle phenomenon of the reaction of degeneration is present. It is in these cases that we come the nearest to signs of centric implication in slight weakness of the sphincters of the bladder and rectum, especially of the former.

The most characteristic—that is to say invariable—change of diphtheritic paralysis is absence of the knee-jerk. This phenomenon not only accompanies the paralysis, but it belongs to diphtheria as a symptom by itself; for, according to Bernhardt, it occurs in about two-thirds of all cases of diphtheria which have no paralysis of any kind. The existence of a post-latent stage in this disease is thus demonstrated, even if we did not have diphtheritic paralysis, for, according to Bernhardt's observations, its most usual time of development in non-paralytic cases is in the second month, though it sometimes begins at the end of the first. Prof. R. L. McDonnell, Physician to the Montreal General Hospital (THE MEDICAL NEWS, October 15, 1887), however, has published records of eighteen cases of diphtheria admitted into his wards, in ten of whom the knee-jerk was absent on the day of their admission, and while they were suffering from the first symptoms of the disease. His first case was that of a previously healthy boy who had just returned from a visit to a friend when he had an attack of supposed quinsy, and now merely complained of feeling weak. There was nothing to point to the preëxistence of diphtheria except a slight discharge from the nose, and the absence of the knee reflexes. There were at his home four children, three girls and a boy, between the ages of eight and sixteen. Isolation was attempted, but it was too late, for three of the four children took the disease. The patient eventually suffered from great debility, with regurgitation of food, and his voice became quite nasal. The knee-jerk did not become normal for four months. The sisters were admitted to the hospital, where one died, the other two lost the knee reflexes immediately, and subsequently had diphtheritic paralysis. Dr. McDonnell supposes that early loss of the reflex is a pretty sure indication of the advent of paralysis, for, of the ten cases above mentioned, two died, four developed nervous symptoms while yet in the hospital, but of the remaining four no satisfactory report could be obtained of their condition after they left the hospital. Of the eight patients, however, whose knee-jerk was unaffected on admission, paralysis appeared in one, two died, and of the rest no history could be obtained. From these data he concludes that, 1. In a considerable number of cases the knee-jerk is lost from the beginning of the disease, and thus affords a valuable means of diagnosis of the nature of the throat affection; and 2. That absent knee-jerk at the beginning has no influence on the prognosis.

This observation is certainly worthy of being generally tested in acute cases of diphtheria, for it does

not seem to correspond to the experience of others who have found this symptom only in what I term the post-latent stage of the disease. It is not impossible that it was characteristic of the epidemic in Montreal during the time when the observations were made, for we often find seasonal peculiarities in the epidemics of diphtheria as in other epidemics, such as exceptional liability to nephritis in scarlatina, or to intestinal hemorrhages in typhoid fever.

The fact, however, remains that this symptom is of such constant occurrence in diphtheria, and is so significant in itself, from its relation to other nervous diseases, of the nature of the morbid process in diphtheritic paralysis, that it takes the first rank in the consideration of the true pathology of the affection. Dr. Angel Money, in his work on *Diseases of Children*, and also in the discussion on "Diphtheritic Paralysis" in the London Clinical Society, Sept. 1887, speaks of an initial exaggeration of the knee-jerk in many cases as preceding its total loss, thus resembling the same phenomenon in other diseases when it is indicative of the primary nervous irritation which precedes the stage of paralytic exhaustion. I think, however, that this condition must be very exceptional, and suggestive of some exceptional inflammatory element in the parts implicated, for in my opinion, inflammation, either central or peripheral, has nothing to do with true diphtheritic paralysis.

To sum up the conclusions as to the pathology of diphtheritic paralysis from its clinical features alone, before we go further:

1. We would infer that diphtheritic paralysis is due to a peripheric and not centric nervous disorder, because it is so difficult to conceive of the central nuclei being primarily affected in many cases of diphtheria, without their closely contiguous or associated nerve centres becoming also involved, as they are in all other nervous affections where the centres in question are affected. Thus, to take the motor nerves of the palate. According to Vulpian's experiments on dogs, supported by Horsley's and Beevor's experiments on monkeys, the azygos uvulæ and the palatine muscles generally are supplied with motor filaments from the spinal accessory nerves, and not from the motor branch of the fifth, as usually taught. But considering the close association of the nucleus of the spinal accessory with the vagus, on the one hand, and with the laryngeal and cervical muscle nerves on the other, it is hard to see how a case of bilateral paralysis of the palate, if of centric origin would not simultaneously give us symptoms connected with some out of a very extensive array of closely associated motor movements. The facts are, however, that when laryngeal or cervical disorders manifest themselves, it is not simultaneously with the palatine paralysis, but not until long afterward, and generally in a most capricious manner, if contiguity of the centres be supposed to have anything to do with the causation of the disorder. The same may be said about the paralysis of accommodation. If it be of centric origin, as already mentioned, it is difficult to explain why the other branches of the third nerve escape in diphtheria, when they rarely do so in anything else; and here again, while paralysis of the internal rectus has been frequently reported in diphtheria, it does not occur usually until the accommodation paralysis has got well, and as a very late symptom of the case. Moreover, we do not find here the usual associations of third nerve paralysis, such as that of paralysis of the superior rectus with the levator palpebræ. In fact, one of the great characteristics of diphtheritic paralysis is, that it seems to disregard centric associations on principle, as when it attacks the motor branches of the superior laryngeal without involving the recurrent laryngeal, and *vice versâ*.

2. We would conclude from the clinical facts of diphtheritic paralysis, that it is not due to any inflammatory affection of peripheric nerves, that is, not to a true neuritis. I would here anticipate a reference to the pathological anatomy of diphtheritic paralysis, by saying that I do not regard that anatomical change in nerve fibres to which the term parenchymatous neuritis is applied, as a neuritis at all, in the sense that it is caused by a true inflammatory process; rather I regard it as a primary degeneration of the nerve elements quite distinct from inflammation. *Interstitial* neuritis, on the other hand, is the only true neuritis, as it is accompanied by cell infiltration, etc., characteristic of all inflammatory processes, and while nerve degeneration does occur from interstitial neuritis as a result, it is not the primary or the essential process of the affection. Thus alcoholic peripheral neuritis is a neuritis, but the diphtheritic change is no more so than Wallerian degeneration is a neuritis. Now the great clinical feature of neuritis is pain; and absence of pain is the distinctive feature of diphtheritic paralysis. Not but that a true neuritis and nerve pain or tenderness do occur in diphtheria; they do sometimes, but, as I believe, from an independent purulent infection, as we will soon mention.

3. That from the start diphtheritic paralysis is characterized by paralysis of reflex impressions. This of itself is conclusive against a primary inflammatory element; and, moreover, that view is further supported by the absence of signs of inflammation of the vasomotor nerves, which are so sensitive to inflammatory irritation. This early abolition of reflex movements is not only shown in the patellar reflex, but elsewhere even more strikingly. Thus there is not in the body a more wide-awake "reflex" region than at that important switch where the tract of deglutition crosses the tract of respiration. In the treatment of epilepsy, for example, I pay a great

respect to the reflex susceptibilities of that district from the palate down, till the larynx is well cleared, for it is doubtful how much the habit of rapid reflex excitation, by allowing children to eat fast, has to do both with causing and with keeping up epilepsy. But it is just here that diphtheritic paralysis shows its most signal deadening of reflex action. Often not the slightest attempt at gagging will follow the most prolonged titillation of the palsied palate, and the epiglottis, when affected, may be fingered without the least protest.

As to the pathological anatomy of diphtheritic paralysis, we owe to Déjerine the first conclusive demonstration that this affection has for its anatomical basis a change similar in all its essential features to the changes found in multiple neuritis from any cause. In a recent publication by this distinguished investigator, he describes the segmentation of the myeline, the multiplication of the nuclei in the sheath of Schwann, and the disappearance of the axis-cylinder without any signs of interstitial inflammation, as typically developed in a case of diphtheritic paralysis, as in any case of descending Wallerian degeneration. A similar observation is carefully reported by Mendel, in a case of general ophthalmoplegia, where the nerve centres presented no morbid appearance whatever, although the alterations in the nerves to the eyeball muscles were profound. (Gowers, *Dis. Nerv. Syst.*, p. 1231.) On the other hand, a case reported by Paul Meyer, in Virchow's *Archiv*, Bd, lviii. Heft 2, shows that in long-standing cases the process travels up the nerve trunk for a short distance and then skips, as it were, to the root, and then passes into the horns of the gray matter. Meyer, in distinction to most observers, found both the anterior and posterior horns involved, though the former more extensively, and he comes to the conclusion that the diphtheritic agent poisons the nervous textures indiscriminately, both centric and peripheric, so that there is no reason to regard the one as secondary to the other. This, however, is too broad a deduction to make from a single case, in view of the fact that in other diseases characterized by peripheral neuritis, centric changes are sometimes found associated with it. Indeed, it is antecedently probable that extensive lesions involving either region of nerve distribution may often affect the other, so as occasionally to render it difficult to decide which is the primary seat of the process.

Buhl, Gowers, and other writers describe signs of interstitial inflammation of the nerves in some cases. Thus Buhl reports having found evidence of congestion, and even hemorrhage, about the anterior nerve roots. In one case he found the nerve sheaths infiltrated with bodies which he describes as occurring also in great numbers in the false membranes in the throat. Practical bacteriologists are the only ones who can decide the relationship to pathology of such bodies, but in view of the tendency of late researches to reduce most of the alleged specific forms to a single, widely spread organism, we may infer that we have in this case also the same *streptococcus pyogenes* which has done duty as the erysipelas coccus of Fehleisen, the pneumonia coccus of Weichselbaum, the scarlatina coccus of Klein, the diphtheria coccus of Löffler, etc.[1] As far as our present knowledge extends it seems that wherever there is an external focus of ulcerative and suppurative processes, and notably in such a rich bed of lymphatics as the tonsils present, the general system may become infected by absorption both of micrococci and of poisons generated in the inflamed parts, some of which give rise to internal inflammations of various kinds, including neuritis, but further or more definitely than this it is not easy to go.

Muscular degenerations, as might be expected, accompany in varying degrees, however, the nerve lesions of diphtheria. Granular and fatty changes of the muscle fibres have been found irregularly distributed, not only in the same part of the muscle but in different parts of the same fibre. Such alterations have been demonstrated most in the palate, but also in other regions, and especially in the heart. This organ, however, suffers from more than one condition in diphtheria, namely, in the early and in the post-latent stages of the disease. Sudden cardiac failure in the early stage is doubtless due to entirely different causes from cardiac weakness coming on many days afterward in association with late throat and trunk paralyses. In some instances again distinct myocarditis has been demonstrated.

Finally the interesting question presents itself, What is the special agent present in the system which causes diphtheritic paralysis? In the first place it can hardly be the original infective material which is *the* cause of diphtheria, because that belongs plainly to the class of agents which occasion communicable diseases; in other words, it is a living self-multiplying organism. Nothing else can ever cause a communicable disease. For many years I have been accustomed to restrict the term virus to such agents, in distinction from the term poison, which, whether of mineral, vegetable, or animal origin, can never reproduce itself nor ever communicate a disease. It must act always according to quantity, while a virus acts only by growth. Now diphtheritic paralysis is no more catching than any other paralysis. It occurs only after there is nothing more to catch from the patient, generally weeks after the infective agent has done its work. On the other hand our knowledge of the action of the micro-

[1] Prof. E. Crookshank, Distribution of Streptococcus Pyogenes. Lancet, Jan. 21, 1888. Also G. Moos, Bacterial Invasion of Inner Ear in Diphtheria. Archiv. Otology, vol. xvii., No. 1, trans. by Dr. H. A. B. Macauley, New York.

organisms is sufficiently advanced now for us to know that some of them evidently cause disease by generating definite poisons or ptomaines which are absorbable into the blood, and then act there just as other poisons act, some of them as even arsenic does, causing multiple neuritis of a disseminated and yet selective kind. This renders it quite conceivable that a ptomaine may follow upon the changes which the diphtheritic process sets up in the organism, and thus produce all of its characteristic symptoms. The special tendency of diphtheritic inflammation to cause necrotic and gangrenous lesions lends a further support to this surmise.

The late appearance of the symptoms, however, seems to be in harmony with some of the more recent additions to our knowledge of the life history of microörganisms, especially of the saprophytic kind. In the Presidential Address at the last meeting of the British Microscopical Society, Dr. Dallinger gives a very interesting summary of the successive changes which a piece of animal tissue has to go through before it is finally resolved into its component inorganic materials. First begins bacterium termo and does its work with an amazing multiplication of its own form and, moreover, with definite chemical changes as the result of that work. In the course of a week or more, dependent upon the period of the year, there is a rapid succession of spiral forms, such as *spirillum volutans*, *spirillum undula*, and lastly, *bacterium lineola*. After these have done their work and disappeared with further changes in the material, appear two new forms, *cercomonas typica* and *monas dallingeri*, both simple oval forms, but the former has a flagellum at both ends of the long axis of its body, while the latter has a simple flagellum in front. When these have done their work, two new striking forms, *tetramitus rostratus* and *polytoma uvella*, make their appearance, to be followed in turn by *heteromita rostrata*, and *dallingeria drysdali*, the latter the most powerful in its decomposing power of all.

As Dr. Dallinger says, the most important of all ferments, that by which nature's dead organic masses are removed, is one which there is evidence to show is brought about by the successive vital activities of a series of adapted organisms, which are forever at work in every region of the earth.

We may here remark that as the processes of nature are never wholly exceptional, but often are reproduced in many different, yet analogous forms, as in the long known succession in the processes of saccharine fermentation, first to alcoholic, then to acetous changes, so it becomes quite conceivable in view of such facts as these to infer that the working of the diphtheritic organism may prepare, in certain cases, the way for some subsequent process in the body by another organism, when the conditions for its growth have been fulfilled by the antecedent presence of the diphtheritic agent, and that it is during this subsequent process that the poison which works such mischief on the nervous mechanism is produced. As regards diphtheria, this surmise is rendered more probable by the remarkable account of Boissarie cited by Gowers, of an epidemic in a certain district of Paris, where there occurred a series of cases of severe diphtheria, and at the same time a series of cases of paralysis of the palate, eyes, trunk, heart, etc., perfectly like that which occurs after diphtheria, and accompanied by albuminuria. The remarkable fact is that in these cases of primary palsy there was no history of preceding sore throat, and in several of them distinct diphtheria followed the paralysis, which lessened during the throat affection, indicating that the poison of the paralytic disease was of a different origin from the virus of the diphtheria, and hence it is likely that its producer can, under certain circumstances, exist and form its specific ptomaine without having the diphtheritic agent to prepare the way for it. The late researches of Pitres and Villiard on peripheral neuritis occurring after typhoid fever, with instances of the same paralysis of the palate, and of accommodation occurring after that disease as after diphtheria, further lend color to the surmise that we may have an independent origin from some successive organism of the paralyzing poison, which develops, generally, only after diphtheria, but may also after typhoid, and, perhaps, after other fevers, or occur independently, as in Boissarie's cases.

I have but a few observations to make as to treatment. The ordinary course of diphtheritic paralysis is toward spontaneous, though slow, recovery, and, hence, as in chorea and other affections which get well with or without treatment, it is difficult to gauge the influence of the remedies which are recommended. There are certain consequences, however, of the interruption of function by the paralysis of particular muscles which give rise to dangers of their own. Both for frequency and for seriousness, paralysis of deglutition with insensitive epiglottis takes the lead. The patient is not only liable to lose strength rapidly from the difficulty of feeding him, but as we might expect from the close association of the action of the œsophagus with the heart, cardiac failure is to be dreaded as well. Here, as in other tracks of diphtheritic paralysis, I have found the recourse to strychnia and to electricity very disappointing. The faradic current, used as a general cutaneous irritant to the chest, may assist, reflexly, to stimulate the nerves of respiration, as Duchenne recommends it to the back of the chest in paralysis of the muscles of expiration, but I have not been able to assure myself that either the constant or the interrupted current is of much service when locally applied to the palate or throat passages. Instead, I have found that topical irritants seem occasionally to be quite

effective. In palatine and pharyngeal paralysis I begin early with brushing the parts every few hours with a paste of black pepper and honey, and the effect seems to me much more permanent than the ordinary transitory impression of electricity toward awakening the lost, but vitally important, reflex excitability of the parts. Parenchymatous neuritis should always be treated by stimulants, for it is essentially a condition of loss of vitality from the first, and hence in paralysis of the limbs, trunk, etc., I have the parts enveloped twice a day in a pack of infusion of capsicum of the strength of a drachm of the powder to a pint of boiling water, the application to last from ten to twenty minutes. Of medicines, the tr. phosphor., teaspoonful t. i. d., if the kidneys are free, is my favorite.

In accumulation of mucus in the bronchi in respiratory paralysis, there is no reason why the posture treatment, which does so much good in cases of bronchial palsy, should not be tried here. The patient should be let down on his hands from the bed with head down and encouraged to cough, and frequently a short recourse to this measure will result in expelling a quantity of suffocative fluids from the trachea with great relief to the respiration for some time. Cardiac complications require special attention. For the failure which threatens life during the diphtheria itself, alcohol should be given in heroic doses, as recommended by Jacobi, but digitalis never. I shall not soon forget the effect I once witnessed of the administration of this drug in a young man who was sinking from heart failure in the first week of the disease, when I reluctantly yielded to his physician's request to sanction its administration, for every visible artery pulsated after it, just as in cases of extreme aortic regurgitation. When the heart is involved in the later paralysis, the possible presence of myocarditis should not be forgotten. I think that iron, and the explanation of iron as a remedy—oxygen, are our chief resources against this condition. The patient should be kept prone, and as often, or as much as possible, in the open air.

UNILATERAL ANOPHTHALMUS—WITH A CASE.

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THE subject of anophthalmus is one of interest alike to the student of teratology and ophthalmology—to the one it is another example of a very constant rule—to the other it is an exception to the histological process with which he is familiar. The monoculus of cyclopia, occurring both in the human subject and lower animals as the result of fusion in an acephalous monster, early attracted attention, and soon received a proper explanation.

Exceedingly numerous also in literature are cases of microphthalmus, in which the eye has been arrested at some particular period of its development, without either atrophy or disease, so that although perfect, perhaps, at birth, its size is diminutive in proportion to the surrounding parts.

Anophthalmus, more properly anophthalmus bilateralis, or complete absence of eyes, was first described in 1609, in Monstrorum Historia, since which time numerous cases have been recorded.

Anophthalmus unilateralis, a much rarer deformity, consisting in the complete absence of an eye, the other remaining perfect or microphthalmic, was first described by Klinkosch,[1] a Bohemian surgeon, in 1766, since which time about 22 cases have been recorded. The term anophthalmus unilateralis would seem to serve better to distinguish these cases from the monoculus of cyclopeæ, than the term monophthalmus, given by some writers. More recently (1881), Dr. E. Hocquart[2] has written an able article on cryptophthalmos—in which in the dissected cases (4) a rudimentary eye was discovered—apparently arrested at the period of formation of the lens.

Observers generally have described the anophthalmus bilateralis as much more common than the unilateralis; and Collins[3] in reporting his case (bilateral) collected 30 of the former, and 12 of the latter, which corresponds to the proportion given by most systematic writers. To these 31 cases might be added 6 others: those of Neary,[4] Radzwzewski,[5] Skrebitzky,[6] and H. Magnus[7] (2 cases), and Stjeminski.[8]

CASE.—W. H., male adult, fifty-two years, married, of English birth, presented himself at the clinic of Dr. A. Douglas Hall at Wills Ophthalmic Hospital, suffering from a traumatic abrasion of the left cornea. There was no history of deformity in the family, consanguinity of parents, or maternal impression. On examination the right eyeball was found entirely absent, there being only a small fibrous mass at the bottom of the orbit. The lids and cilia were well formed, but collapsed, and the palpebral fissure shortened. The lachrymal gland and canals were absent. The orbit was remarkably well formed, and gave the appearance of having lost its contents by enucleation.

In the left eye the tutamina oculi were normal, and the eyeball well formed. There was, however, a coloboma of the lower inner segment of the iris, and also of the choroid. The lens and ciliary body were intact, and vision was good.

The peculiarities of the case are the development of the orbit, and the association of coloboma of iris and choroid in the other eye.

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[1] Progr. ad ann. Acad., Prag. 1766.
[2] Arch. d'Oph., vol. i. p. 289.
[3] Oph. Hosp. Reports, vol. xi. p. 429.
[4] London Lancet, vol. i. p. 175, 1888. Rep. Roy. Ac. Med. Ireland.
[5] Progrès Méd, Aug. 7, 1886. Rec. d'Ophth., 1886, viii. p. 647.
[6] Klin. monatsbl. f. Augenh., 1881, xix 421.
[7] Arch. f Augenh.. Wiest 1882-3, xii, p. 297.
[8] Vest. ink. oftalmol., Kieff, 1881, vi. 364.

The literature on the subject of unilateral anophthalmus is meagre. To the 12 collected cases of E. T. Collins, the writer desires to add 11 more collected from accessible literature, those of Klinkosch,[1] Rudolphi,[2] V. Walther,[3] Peringer,[4] Hirschberg,[5] Godley,[6] v. Reuss,[7] v. Arlt,[8] Haederath (2),[9] and Chisholm.[10]

From a study of all these cases (12), including the writer's, certain peculiarities were observed.

The age at which they came under observation varied from birth to fifty-two years, of which three were stillborn.

In the 4 cases in which the sex was given, 2 were males, and 2 females. The family history was not recorded in any.

Of other deformities, 3 were monsters, one of which (Klinkosch) had a deformity of the skull and contents on both sides: the hemispheres were not separated, and the ventricles were formed into one large sac filled with water. In another the optic, olfactory, and third, fourth, and sixth nerves were absent. The palpebral fissures of five were described as smaller and shrunken, in one the lids were absent, and two had cysts in the lower lid.

The orbits were described as small in two, and deformed in one, and one contained a large cyst—the remains of the sclerotic, and two others, remains of bulbs.

In two cases the lachrymal apparatus was entirely absent. In 6 out of the twelve cases the other eye was microphthalmic, of varying degrees—one of which contained also a cyst, the size of a walnut, and one (the writer's) had coloboma of iris and choroid.

The earlier writers attributed this defect to congenital hydrops oculi, by which the eye burst, and finally atrophied, but that the more recent explanation, based on embryological facts, is correct, does not admit of a doubt.

This is particularly well shown in the reports of the post-mortems (9) of bilateral cases collected by E. T. Collins,[11] in which not the least trace of an eyeball, or anything resembling it, could be found. "Not in any case was the optic nerve found to enter the orbit; in one it ended in a cone shape at the optic foramen, in another in a fibrous filament, and in five the chiasma was absent. What had happened," he says, "was this, that no primary optic vesicle had budded out from the anterior primary encephalic vesicle, or, having budded out, had failed to form a secondary optic vesicle."

The remarkable development of the appendages, which are derived from the epiblastic and mesoblastic layers; the cases of so-called cryptophthalmus bilateralis, before referred to; and the association of anophthalmus with microphthalmus, and coloboma of the iris and choroid, are all interesting in themselves, and add additional weight to the correctness of the theory.

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1 Klinkosch, loc. cit.
2 Berlin Med. Encyc., Wörterb., t. iii. p. 285.
3 Netes in angeborenen Fetlhaut gdscowülste, etc., Landshut, 1804.
4 Med. Jahrb. d. Oester. Staates N. Folge, Bd. iv.
5 Trans. by J. Furst, Arch. Oph., N. Y., 1879-80, viii.
6 Brit. Med. Journ., 1883, i. 253.
7 Wien. med. Presse, 1885, xxvi. p. 178.
8 Allg. Wien. med. Ztg., 1885, xxx. 105-107.
9 Ueber monophth. congen. Diss. Bonn, 1871.
10 Gaillard's Med. Journ., N. Y, vol. xxix. p. 191.
11 E. Treacher Collins, loc. cit.

MEDICAL PROGRESS.

Acute Poisoning from Quinine.—ROSENBUSCH, in a recent number of the *Przeglad Lekarski*, reports a case of acute quinine poisoning, which he had observed in the hospital of Prague. After the administration of 15 grains of the sulphate of quinine the patient was attacked with shivering, tinnitus aurium, severe headache, cold and pains in the extremities, palpitations, and vomiting, with great prostration. An hour later the patient became unconscious, the temperature rose to 103.5° F., the pulse was 158 and compressible, the pupils contracted, but reacting to light, the tongue dry. The skin of the face and the whole body presented a uniform redness, resembling that of scarlet fever, and composed of many small confluent patches. The likeness to scarlet fever eruption was the more striking as the neck and the thigh were very deeply colored. Respiration was difficult. Castor oil, caffein, and cold compresses to the head and the cardiac region were ordered. On the following day the temperature was only 97° F., the pulse 108, with considerable arterial tension. The patient had a restless night and was delirious; the bowels acted toward morning, the rash became paler, the pupils regained their normal size, the tongue became red and coated with yellow patches. Sensations of tearing and trembling in the extremities were complained of. Bromide of sodium was given. The rash and all the other symptoms described disappeared in two days, and only a slight pigmentation of the skin remained. The patient had stated that, five years ago, he had a similar attack after taking two powders, each containing 7½ grains of sulphate of quinine. On that occasion the rash disappeared the next day. Dr. Rosenbusch points out that this case is specially interesting by reason of the high temperature, which had never before exceeded 101.5° F.; also on account of the great resemblance of the rash to that of fever, from which at first it could hardly be distinguished. The absence of throat symptoms and the sudden occurrence of a diffuse and uniform blush over the whole body were the chief features which differentiated the affection from scarlet fever.—*British Medical Journal*, May 5, 1888.

Glycerine as a Laxative.—NOVATNY is quoted by the *Centralblatt für die gesammte Therapie* for May, 1888, in his report of two hundred cases in which he used glycerine, per rectum, as a laxative. The dose was from thirty to forty-five minims; the effect was generally pro-

duced in from one to two minutes; in a few cases two or three hours elapsed before defecation ensued. Novatny considers the effect produced to be due to the increased peristalsis, extending to the small intestine, producing increasing secretion and fluid stools.

Oxide of Zinc in Infantile Diarrhœa.—M. DUPRÉ stated at the Société Médicale de Reims that oxide of zinc is by far the most effectual remedy in infantile diarrhœa. It should be prepared as follows:

℞.—Sublimized oxide of zinc . .	gr. 55
Bicarbonate of soda . . .	gr. 25
Tincture of krameria . . .	20 drops.
Plain syrup	30 "

A teaspoonful of this preparation is given every half hour until vomiting and diarrhœa have ceased. The first teaspoonful stops the vomiting, and the third or fourth the diarrhœa. In the few cases in which this treatment fails in entirely checking the disease, it gives great relief and prevents complications. From 1884 two hundred and thirty-four cases, all of which occurred during the months of July, August, and September, were treated by oxide of zinc, and among these only eight deaths were registered, the death-rate being thus only 4.7 per 100.—*British Medical Journal*, April 28, 1888.

Intra-muscular Injection of Mercury in Syphilis.—The *Medical Press* of April 25, 1888, writes, that the inconveniences to which mercury administered by the mouth is apt to give rise, and the uncertainly which exists as to the precise amount that is being absorbed, have led certain practitioners to resort to injection into the tissues, as a more reliable and, withal, a more convenient method of exhibiting the drug. The earlier attempts in this direction were not attended with the success that had been anticipated, inasmuch as they gave rise to so much pain and such untoward sequelæ as to render continuous treatment impossible. Since others, however, undeterred by the suffering in which they were not called upon to participate, carried their investigations further, it was found to be possible to administer the drug in this way without the untoward results which attended its employment in the first instance. In a paper read before the Medical Society of London, MR. ASTLEY BLOXAM gave the results of a very extensive experience with the different preparations that have been suggested. The preparation which, in his hands, has proved the most uniformly successful and free from inconvenience, is a solution of *sal Alembroth*, containing perchloride of mercury and chloride of ammonium, ten drops of which are equal to a third of a grain of the perchloride. This he injects deeply into the muscles of the buttock. The proceeding is said not to be very painful, though as to this the opinion of some of the patients would be desirable, and no abscess has ever been known to follow. Its advantages are, that the stomach is not deranged, that one injection a week is sufficient to keep the patient under the influence of the drug, and that the disease may be cured with some seven or eight grains of the salt, spread out over a year or eighteen months.

An Interesting Case of Lead Poisoning.—The Paris correspondent of the *British Medical Journal* writes that at the meeting of the Surgical Society on February 9th M. Duguet described a case of lead poisoning. The patient' a woman, aged thirty-eight, was employed in a factory where colored cardboard boxes are made by machinery. Her business was to gum small bands of paper 0.15 centimetre long on these boxes, which were intended to hold reels of cotton. These paper bands are colored red and orange on one side, being gray on the other side, which is covered with gum. In taking up these bands, which are packed in layers, the patient was obliged to wet her finger with her tongue each time, and slip off each band, of which the red and orange side is placed uppermost, with her finger. The gray side of the band had then to be licked, and the band gummed on the box. The patient had frequently gummed as many as 5000 of these bands in one day. She stated that all her companions (eight or ten) who did the same work, all became pale and thin, and suffered from colic. Those who were employed in pasting on blue-colored bands of paper were not affected with any morbid symptoms. The red and orange bands of paper were analyzed by M. Gur. The residue of the paper, when burnt, gave all the reactions of salts of leads. Each band contained about 12 milligrammes of metallic lead. This form of lead poisoning has not been described before. M. Monod suggested that the case should be reported to the Préfect de Police.

The Antiseptic Treatment of Pharyngeal Diphtheria.—HUCHARD employs the following method of treatment:

The application to diseased surfaces of an alcoholic solution of bichloride of mercury, 1 to 1000. Irrigation with boric acid solution, 1 to 100. Internally the administration, hourly, of teaspoonful doses of

Sodii benzoat.	ʒ 2½.
Aquæ menth. piper.,	
Aquæ destillat.	āā ʒ 10.

Alcoholics, coffee, and nourishing foods should be given, and the air of the room antisepticized by a spray of the antiseptic substance found least irritating.—*Revue de Thérapeutique*, April 15, 1888.

An Epidemic of Various Eruptions following Vaccination.—The Report of the Royal Bureau of Hygiene at Berlin for 1888 (*Veröffentlichungen des Kaiserlichen Gesundheitsamtes*, 1888, No. 3) contains an interesting account of peculiar cutaneous eruptions which accompanied the use of vaccine virus from three heifers, in the vaccine farm at Eberfeld. This farm was in apparent good order; it had been inspected regularly, and its officials were reliable and skilful. Among a large number of successful vaccinations occurred skin eruptions, many of them contagious, among those children and adults vaccinated with the lymph from certain three heifers. The presence of any especial disease in the animals was not recognized. The eruptions were a contagious impetigo, a contagious pemphigus, urticaria, and herpes, accompanied by pruritus. In some cases pustules formed about the original pustule, resembling auto-inoculation. Among children several deaths occurred; in one of these cases post-mortem examination revealed a subscapular abscess, with sero-sanguinolent fluid in the pleural sac. Considerable constitutional disturbance followed the occurrence of the eruptions; contagion seemed to be promoted by schools, and the occurrence of the harvest. By order of the Government the vaccine farm was temporarily

suspended; all instruments and appliances were destroyed, the buildings most thoroughly disinfected, and the heifers destroyed. Vaccine lymph subsequently produced at this farm was excellent in its results. The physician-in-charge sent a specimen of lymph to Berlin for examination. The microscope showed isolated bacilli, and numerous micrococci which multiplied in chains and did not liquefy gelatine. No control experiments, by inoculation, were made.

Wine of Ipecac by Inhalation.—MURRELL reports in the *Medical Press* of April 25, 1888, six cases of various affections of the lungs which were greatly benefited by inhalations of wine of ipecac, in spray. He concludes that most successful results are obtained from the employment of the ipecacuanha spray in cases of chronic bronchitis and bronchial catarrh. In fibroid phthisis there is often a marked improvement, even when no constitutional treatment is adopted. A single inhalation will sometimes restore the voice in cases of hoarseness due to congestion of the vocal cords. It is a matter of little importance whether the spray be given with a handball spray apparatus or with a small steam vaporizer. In either case the spray must be warm and the patient should not go out for some minutes after inhaling. Care should be taken te see that the spray really enters the chest and is not stopped by the arching of the tongue against the wall of the mouth. The best results are obtained by using the spray for about ten minutes, three or four times a day. In the majority of cases of winter cough relief will be obtained in ten days.

Creolin, Internally.—SPAETH, of Frankfurt, in the *Münchener medicinische Wochenschrift* of April 10, 1888, gives the following formula which he has found useful in prescribing creolin internally:

Creolin.	ʒ 3.
Tragacanth. pulv.	gr. 30.
Spirit. dilut.	♏ 30.
Glycyrrhizæ pulv.	ʒ 6.
Muc. gum. acac.	q. s.

Ft. pil. 200 in num.

Dose.—One pill, two or three times daily.

The Dangers of Saccharin.—The Paris correspondent of the *Medical Press*, of April 25, 1888, writes, that in introducing a discussion on this subject, M. WORMS said that the most interesting application that he made of this remarkable product was that of enabling those who suffer from glycosuria the possibility of eating sweetened aliments without the fear of increasing their malady. But he found that saccharin was not very well borne by the patients to whom he gave it. Out of four treated, only one was able to continue its use, the others suffering from gastric disturbance. Consequently he considered there would exist a certain amount of danger to the public if the drug were to be extensively used by grocers, confectioners, etc., in the sweetening of their products, as twenty grains of saccharin have a sweetening power equal to nine ounces of white sugar. M. DUJARDIN said he had not met with the accidents mentioned by his colleague; he gave as much as 120 grains to a dog without witnessing any ill effects; consequently saccharin was not toxic. However, it could not be considered as an aliment, because it was found after ingestion in the urine unchanged. He agreed with M. WORMS on the necessity of examing the subject more fully, and especially in a commercial point of view, as if this product of tar were to be used by the trades mentioned a very serious prejudice would be caused to one of their most important national industries.

The Disinfection of Apartments.—KRUPIN has recently experimented in the Alexander Barrack at St. Petersburg upon various methods of disinfecting rooms. He found that the ordinary disinfection practised by chlorine gas is inefficient; anthrax spores left in a room so treated were uninjured. The best method of disinfection, from the standpoint of efficiency, convenience, and cheapness, for bedding, clothing, and rooms of the sick, is steam of corrosive sublimate solution one per cent; walls and furniture should be washed with this solution, or one composed of equal parts of corrosive sublimate 1 to 100, and carbolic acid five per cent. Disinfection by this method does not expose a subsequent occupant of the room to danger.—*Deutsche medicinische Wochenschrift*, April 26, 1888.

Suture of a Wound of the Liver.—The *Riforma Medica*, of April 25th, states that Professor Postempski recently stitched up an incised wound of the liver. The operation, which is said to be the first of the kind ever performed, took place in the Ospedale della Consolazione at Rome on April 18th. The abdomen was opened, and the edges of the wound, which was situated in the left lobe, and which was 2¼ inches in length, and ¼ inch in depth, were brought together by two catgut sutures, applied by means of extremely fine needles. The hemorrhage, which had been very free, was at once checked when the wound in the liver-substance was closed. On April 23d, four days after the operation, the patient's temperature was normal, and he was doing well. Professor Postempski will publish the case in detail in due course.—*British Medical Journal*, May 5, 1888,

Cocaine in Diseases of the Genito-Urinary Organs.—FENWICK, in the *Lancet* of May 5, 1888, concludes as follows on this subject; If pain in any part of the body be due to a *slight* nerve irritation of an unimportant character, a cocaine injection into the urethra will rapidly relieve it. If, on the contrary, the pain is due to severe nerve irritation, a cocaine injection will not relieve it. These facts open a large field in the differential diagnosis of the causes of pain, as well as the just estimation of the amount of pain experienced by neurotics and others. I have used it largely in the diagnosis of urinary diseases. For instance, in cases of renal pain, if a urethral injection of a 20 per cent. solution of cocaine immediately relieves a pain in the kidneys, I diagnose a transient or unimportant cause for that pain, such as congestion, uratic urine or grit, colonic pressure, &c. If, however, the renal pain is uninfluenced by such an injection, I give a more guarded prognosis, and this has been several times verified by the subsequent passage of small stone, or, as in one case, by the development of a renal carcinoma. There are also various vesico-urethral diseases, in which cocaine thus used proved of diagnostic value, as in glans pain, urethral pain, suprapubic pain, &c. Lastly, there is every reason to believe that

it will prove of value as a prophylactic agent in warding off, by inhibition, the untoward effects of reflex renal flooding after operations upon the bladder and urethra. I have used the drug with this object for a couple of years, and I hope soon to be able to bring forward physiological as well as clinical evidence upon this point.

Albuminate of Iron.—*The Bulletin Général Thérapeutique* of April 30, 1888, gives the following formula for the preparation of albuminate of iron:

Egg albumen (dried), ...	gr. 45
Cinnamon water	ʒ 7½

Dissolve and add:

Liquid perchloride of iron . . .	ʒ 3
Distilled water	ʒ 10

Mix; add aqua ammonia ♏ 15, shake well and filter. The resulting liquid should be aromatic, reddish-brown, and alkaline. It may be given in milk, or any desired article.

The Incompatibilities of Antiseptics.—BOXALL reports experiments to determine the incompatibility of various antiseptics in the *British Medical Journal* of April 28, 1888, and concludes as follows:

The moral conveyed by the experiments is obvious: avoid as far as possible the admixture of anti-septic agents and their contamination with lubricants and with soap when incompatibility exists. For instance, in employing corrosive sublimate it is advisable to use the same solution for disinfecting the hands (carefully avoiding contamination with soap) and for cleansing instruments[1] as for irrigating the parts, to employ a mercurialized lubricant and to use alembroth dressings. If for any reason it becomes requisite to substitute one antiseptic agent for another, a second should be chosen which is not incompatible with the first, and the same precautions should be observed throughout the series.

The above observations deal with one phase only of the subject. I am content to leave to more able hands the elaboration of further details. The second question—the chemical nature of the bodies produced—is for the chemist to answer; the third point—the antiseptic value of these bodies—still remains for the germiculturist to determine. When these points have been settled and acted upon, less scepticism as to the value of antiseptic agents may be looked for. The fault lies not so much with the antiseptics themselves as with the unscientific method in which they are often employed.

Alcohol as a Digestive Tonic.—In a discussion on the use of alcohol at the recent Congress of German Physicians at Wiesbaden, VON JAKSCH, in speaking of alcohol as a digestive tonic, said that alcohol is of positive value in those cases where no pronounced anatomical alteration of the stomach is present, and also no great alteration in the quantity or quality of its secretions. In neurasthenic patients, where a tonic and hypnotic effect is desired, beer is advised. For the promotion of digestion, light red and white wines are best. For stimulation, alcoholics of high percentage are indicated. Von Jaksch, and all who took part in the discussion, were decided in their expression regarding the necessity of limiting the use of alcoholics in accordance with the indications stated.—*Deutsche medicinische Wochenschrift*, April 26, 1888.

[1] Here, again, a caution is requisite, for copper and steel, unless nickel-plated, are apt to decompose the solution and to cause precipitation of the mercury in a free state.

Micro-organisms in Vichy Water.—Some elaborate investigations, which have been undertaken by DR. FRÉMONT, have apparently resulted in the discovery of a number of microörganisms in the mineral waters of Vichy. The microscopic bodies vary according to the source of the water, and some are said to possess the property of acting upon food substances and assist in the transformation of the latter into peptones. A Commission has been appointed, consisting of several noted scientists, to inquire into the alleged discovery, and, upon the whole, we cannot but feel some satisfaction that this is the case. The result of their researches will certainly be watched with interest by those whose convictions on the utility of Vichy waters are beyond cavil; for we may presume that most persons who patronize these waters would prefer to leave the peptonization of their food to the ordinary arrangements of digestion, and would object to the intrusion of microörganisms to a wholesale extent, whatever the effect might be. Reflective minds, however, may find in this record the germ of a large therapeutic earthquake. It may be that the utility of Vichy waters has hitherto depended upon the microörganisms they contain, and extending this hypothesis to other medical agents, it may be the case that each drug has a germ which thrives and develops in the blood only when the drug is given. Thus to make an extravagant suggestion, it may be, after all, the fact, that the action of drugs depends directly upon germ life.—*Medical Press*, April 18, 1888.

Soluble Iodo-tannate of Mercury, for Hypodermatic Use in Syphilis.—NOURRY, of Paris, has found the following combination productive of a salt easily soluble for injection in the treatment of syphilis:

Hydrarg.	gr. ⅛
Iodini	gr. $\frac{1}{10}$
Acid. ratanhiæ tannic.	gr. $\frac{3}{8}$
Glycerin. pur.	♏ 15

This injection is not followed by pain, abscess or induration. Its absorption is very rapid; in forty-eight hours after taking the quantity stated, violent salivation and gastric disturbances may occur. The ordinary injection of this compound should, therefore, not be more than one-half a Pravaz's syrings (seven minims) of the solution.—*Bulletin Général de Thérapeutique*, April 30, 1888.

The Development of the Pharynx in the Embryo.—PIERSOL, in a preliminary communication to the Medical Society of Würzburg, reports researches upon the development of the pharynx in mammals which show that the pharyngeal space is developed before the branchial arches; that an external and internal pocket, or cavity, form, which subsequently form three, and from which epithelial tubal masses are developed. The middle ear and Eustachian tube are developed from the different divisions of the pharyngeal space. The thymus and thyroid gland are also developed from the divisions of the pharyngeal space. A detailed account of his researches will appear in the *Zeitschrift für Wissenschaftliche Zoologie*.

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SATURDAY, JUNE 9, 1888.

THE MICROBE OF DYSENTERY.

CHANTEMESSE and WIDAL report the discovery of a specific bacterium in dysentery (*Progrès Médical*, April 21, 1888). Working in Cornil's laboratory, they have studied five cases of tropical dysentery and have found the same microbe in the lesions and stools of a fatal case and in the stools of four others. The bacteria were found in colonies in and between the tubular glands of the intestine, in the lymph glands, and spleen. The organisms develop rapidly at the ordinary temperature, thriving on all the usual culture media. They are bacilli, with rounded ends and somewhat thicker in the middle than toward the extremities. They grow luxuriantly in sterilized water from the Seine. Fed to guinea-pigs, pure cultures produce intestinal inflammation and necrosis, the stomach itself being affected. The lesions are more marked when the gastric contents are rendered alkaline. Intraperitoneal injections cause death in two or three days with peritonitis, pleuritis, and pericarditis. The liver is affected in these animals, necroses with colonies of bacilli being found in the portal areas. All the lesions in the experimental cases furnished pure cultures of the bacillus.

From these facts, and the absence of the bacillus in the feces of healthy men, Chantemesse and Widal feel justified in claiming specific properties for this bacillus.

Although the observations they have made are too few in number to bring absolute proof, they are of interest as being the first in which so much has been accomplished. Numerous other investigators have described microörganisms in dysentery, but none, up to this time, have succeeded in cultivating them. Further developments will be awaited with interest.

SPONTANEOUS AND EXPERIMENTAL TYPHOID FEVER IN ANIMALS.

WHETHER typhoid fever occurs naturally in our domestic animals, and whether it can be produced experimentally, are questions which have received most contradictory answers. Veterinarians are by no means agreed on the first point. There is a disease in the horse characterized by swelling and ulceration of the Peyer's glands and enlargement of the spleen, but the recent observations of SERVOLLES and of LEBAT would indicate that with superficial resemblance the affection is etiologically distinct. Anatomically the lesions are very similar, and in the current number of Virchow's *Archiv*, SEMMER has described several cases in horses and dogs. The statements bearing upon the experimental production of the disease are also at variance. While Klein, Klebs, Gaffky, and others obtained negative results, Birch-Hirschfeld, Fränkel, and Simmonds, and Michal and Todor have produced in rabbits, mice, and guinea-pigs a disease with enteric symptoms and swelling of the spleen. In the *Lyon Médical*, No. 14, 1888, PERRET gives the result of some observations upon this question which are of value, as no lesions were produced by the injection of material directly into the duodenum, nor, in a horse, by the introduction of cultures directly into the jugular vein. Nor were positive results obtained in the case of six animals which were fed for many days with potatoes upon which were growing pure cultures of the typhoid bacillus. He holds that the artificial disease has never the true picture of human typhoid, but is rather a septicæmia induced by the penetration of the bacilli.

INEFFICIENT QUARANTINE.

THE great responsibility resting upon the health officer who guards a city and, through it, an avenue to the whole country against the introduction of contagious or infectious diseases from foreign ports, is never more fully recognized than when through his error of judgment or incapacity persons suffering from such diseases are allowed to pass quarantine without recognition or restriction. An error of this kind at any time may lead to extended propagation of disease, with all its ulterior evil consequences.

From information reliably obtained, it seems to be undisputed that the recent occurrence of small-pox in Philadelphia can be traced to a case of varioloid imported on one of the transatlantic steamers which arrived at this port on February 1st of this year; and it is almost as clear that this case was sufficiently suspicious in its manifestations to have been detected by ordinary skill and care. But it was not, and hence the spread of the disease. Moreover the mistaken diagnosis of cases of disease not requiring quarantine, and the consequent useless detention of vessels arriving in port, furnish additional ground for fearing that the people have not the benefit of that experience and vigilance which they have the right to expect in the administration of the important office of Port Physician.

It is incumbent upon the appointing power to select for this responsible position a man possessing undoubted qualifications, especially as the duty of intercepting disease brought to the country through this port is entrusted to his care for a greater portion of the year, and its skilful and intelligent performance is absolutely essential to the protection of the health of the whole country. The best quarantine regulations are fruitless without judicious and efficient execution; and it therefore behooves the Governor of Pennsylvania, in view of the serious allegations which have been brought to public notice, to make careful investigation into the manner in which the duties of the office have been discharged by the present incumbent.

ON Thursday, the 31st ult., a fire broke out on the upper floor of the Medical Hall of the University of Pennsylvania, and destroyed the Histological and Pathological Laboratories. The Wistar and Horner Museum suffered a good deal from water, and many valuable specimens were destroyed by falling plaster and by careless handling in removal. Many books in the Stillé Library were badly damaged by water. The losses are fully covered by insurance. The necessary repairs can readily be completed before the opening of the next session, and we learn that designs have been prepared for a complete rearrangement and enlargement of the histological and pathological laboratories.

THE public of Philadelphia has sustained a severe loss in the death of Miss Alice Fisher, who nearly four years ago was appointed by the Board of Guardians to take charge of the Training School for Nurses at the Philadelphia Hospital. Only those familiar with the inner history of that institution can appreciate the changes which have been effected under her judicious direction. The good work which she has accomplished has stimulated other hospitals of the city, and training schools have been established at the Pennsylvania, Episcopal, and University Hospitals. By no means the least important lesson of Miss Fisher's too brief life in this community has been the demonstration of the fact that the profession of nursing affords an ample, as well as a most suitable, field for women of the highest culture and intelligence.

IT is proposed to begin at once the erection of a Maternity Hospital for the University of Pennsylvania on the grounds of the University Hospital, to consist of a main central building and two wings. Sufficient money is on hand to complete the erection of one wing, and it is confidently expected to finish the whole building at an early date.

AT the recent examination held in Toronto by the Ontario Medical Council, 241 students presented themselves for the primary examination (anatomy, chemistry, physiology, and materia medica), of whom 125 passed and 116 were rejected. At the final or pass examination, which alone entitles a doctor to practise in the Province, of 167 candidates, 97 passed and 70 were rejected.

THE Maine Medical Association will hold its thirty-sixth annual meeting at Portland, Me., on Tuesday, Wednesday, and Thursday, June 12, 13, and 14, 1888, under the presidency of Dr. F. C. Thayer, of Waterville.

THE Association of American Institutions for Idiotic and Feeble-minded Persons will hold its twelfth annual session at the Rossio House, Toronto, Canada, on Monday, June 18, at 3 o'clock P.M., moving to Orillia on the following morning. By resolutions of previous sessions, the following reports will be called for: "On Causation of Idiocy," etc., superintendents reporting from their earliest received cases. "On Status of the Work before the People and Legislatures of the various States." "On Development and Progress of the Institutions represented." "Improvements in School Training and Hospital Care introduced during the past year." "Clinical reports of special cases." A number of interesting papers have been promised.

THE Board of Pharmacy of Brooklyn, New York, has taken official action tending to restrict the sale of "Rough on Rats." It has issued a circular to all pharmacists in that city, stating that, according to trustworthy analyses, the dangerous article contains ninety percentum of arsenic, and directing that all sales thereof hereafter made by them must be in strict accordance with the statutory rules governing the dispensing of poisons. This action we regard as worthy of commendation and imitation, for, while it cannot, of course, prove prohibitory of its purchase by persons bent on self-murder, it will cause druggists and housewives to be more circumspect than formerly in the handling of the deadly compound.

DR. GERSUNG, of Vienna, Assistant to Billroth, has performed the novel operation of transplantation of nerve from rabbit to man. The patient was Dr. von Fleischl, Professor of Physiology at the University of Vienna, who suffered from neuroma in the stump of his right thumb amputated sixteen years before, in consequence of an injury received while making a post-mortem examination. The sciatic nerve of a rabbit was inserted in the interval of the resected median, and held by suture. The operation, which was done under chloroform about two months ago, has resulted in a marked subsidence of the neuralgic distress, and sensibility is becoming reëstablished in the part. It should further be stated that the distinguished patient had been the subject of amputations, resections, and other surgical procedures for the constantly recurring neuromata that promptly developed after every operation except this latest one done by Dr. Gersung.

THE Chair of Hygiene, at Netley, made vacant by the death of Dr. de Chaumont, is about to be filled by the appointment of Dr. J. A. Marston, Deputy Surgeon-General. He has already temporarily occupied the chair during the illness of his predecessor, last summer.

SIR WILLIAM JENNER, having retired from the presidency of the Royal College of Physicians, received from the present officers of the College the highest token of respect, in a visit of gratulation from the President, Senior Censor, Registrar, and Dr. Quain. Sir William expressed his gratification at their visit, and remarked that his rule in life had been never to do more than one thing at a time: first, as an investigator; secondly, as a teacher; thirdly, as a practitioner.

THE following item, purporting to be a cable dispatch from Paris, appeared in the daily press: "An officer was sent to arrest a man, known as the 'Wizard of Montmarte' for the illegal practice of medicine. The wizard was reputed to be an ignorant quack. On the appearance of the officer, the wizard produced a diploma and avowed himself a doctor of the Paris faculty, with full right to practise medicine. He further stated that, although he had distinguished himself at his examinations, he had starved as a regular practitioner, but that having set up as a quack, he had made his fortune, and had now amassed a capital of $80,000. The people had avoided him as a doctor, but rushed to him as a quack."

REVIEWS.

THE RULES OF ASEPTIC AND ANTISEPTIC SURGERY. By ARPAD G. GERSTER, M.D., Professor of Surgery at the New York Polyclinic, Visiting Surgeon to Mount Sinai Hospital and the German Hospital, New York. 8vo. pp. 326. New York: D. Appleton & Co., 1888.

THE author starts with the proposition that owing to the strides made within the past few years consequent upon the general adoption of Listerian principles, nearly all English text-books are inadequate to the wants of modern students. We think he has achieved a high measure of success in his laudable effort to render clear and distinct the underlying principles which govern the practice of all surgeons professing to employ aseptic or antiseptic measures, but which too often appear to the majority of practitioners as "an incongruous chaos of seemingly contradictory and often incomprehensible details, arbitrary and varying according to the predilections or whims of this or that teacher."

Dr. Gerster, with commendable candor, admits that the methods of wound treatment herein explained are, to a certain extent, still undergoing changes, yet it is undoubtedly true that just in proportion to the clearness with which the *principles* are understood is the rarity of changes in the *methods* of achieving asepsis and antisepsis. In his endeavors to render easily comprehensible the adaptation of the principles to various classes of cases, he has minutely detailed innumerable operations, many of which we think had better have been omitted, except that the author would have had to occupy a less prominent position, but then, *that* would have perhaps allowed of a clearer demonstration of the principles of asepticism and antisepticism unencumbered with a mass of notes of essentially similar cases.

Beginning with a succinct account of what is meant by sepsis and asepsis, the treatment of aseptic wounds is first considered with the proper dressings, instruments,

and essentials for public and private practice. Ten minutes' perusal of this section will convince any unprejudiced reader that with but little trouble aseptic methods are as easy of application in private practice as in a well-appointed hospital. While agreeing in the main with the author, why, may we ask, is capillary drainage ignored both in theory and practice, a method which we have proved to be effective in many major and minor operations?

"Soiled wounds" are next treated of, when the differences between "aseptic" and "antiseptic" methods are explained and illustrated. Special rules regarding the treatment of accidental wounds, and special applications of the aseptic method as illustrated by scores of cases, complete the first portion of the work.

"Antisepsis," which, paraphrased, means the treatment of suppuration, is next taken up and fully illustrated by cases.

"The Aseptic and Antiseptic Treatment of Tuberculosis," "Gonorrhœa, its Antiseptic Treatment," and "Syphilis, Aseptic and Antiseptic Treatment of its External Lesions," are the remaining topics discussed by Dr. Gerster.

Agreeing unreservedly with the author that "It cannot be successfully denied that *the surgeon's acts determine the fate of a fresh wound, and that its infection and suppuration are due to his technical faults of omission or commission*," we cannot but hope that this book will be widely read and most thoroughly digested. Many years of extended experience of the principles taught in this work have convinced us of the absolute truth of the above statement. The book is admirably printed on superfine paper; the illustrations, so-called, in most instances show next to nothing and might have been omitted without injury to the work.

THE TREATMENT OF HEMORRHOIDS BY INJECTIONS OF CARBOLIC ACID AND OTHER SUBSTANCES. By SILAS Y. YOUNT, M.D., Physician to St. Elizabeth's Hospital, Member of the American Medical Association, Member of State Medical Society, and Member of the Tippecanoe County Medical Society. Second Edition. 8vo. pp. 102. Lafayette, Ind.: Echo Music Co., 1888.

AT the outset we must take exception to the author's unwarranted assumption that it requires special knowledge, teaching, and training—especially by the perusal of works like the present—to treat piles successfully, for we know that any hospital surgeon of average experience is far better fitted to treat such diseases than the so-called rectal specialists. This may seem severe language, but when the author takes the unscientific position that *all* varieties of internal hemorrhoids are to be treated by weak solutions of carbolic acid, ignoring the fact that in most persons, after fifty years of age *bleeding* ceases and the rectal prolapse is the chief occasion of complaint, while prolapse will recur so long as the tumors remain, our strictures will commend themselves, at least in a measure. Still further, careful perusal of the work by any of our readers will, we are sure, cause them equally with us, to decide that no necessity existed for the production of this book when such excellent works as those of Allingham, Van Buren, and Kelsey's were already in the hands of the profession.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON PÆDIATRICS.

Stated Meeting, May 23, 1888.

THE PRESIDENT, J. LEWIS SMITH, M.D., IN THE CHAIR.

PROFESSOR VICTOR C. VAUGHAN, of the University of Michigan, Ann Arbor, read a paper on

EXPERIMENTAL STUDIES ON SOME POINTS CONNECTED WITH THE CAUSATION AND TREATMENT OF THE SUMMER DIARRHŒAS OF INFANCY.

(See page 621.)

DR. W. D. BOOKER, of Baltimore, read a paper on

A STUDY OF THE MICROÖRGANISMS IN THE STOMACH AND INTESTINES IN THE SUMMER DIARRHŒA OF INFANTS.

It has been ascertained, he said, that in the intestinal tract of all milk-fed infants in health there are constantly present, and in large numbers, two species of bacteria, viz., the *bacterium lactis aërogenes* and the *bacterium coli commune*. These were designated as the obligatory milk-feces bacteria, as distinguished from the inconstant bacteria which are found under various circumstances. The latter are aërobic for the most part, and, as a rule, are somewhat more numerous in the feces of infants fed on cow's milk than in the feces of sucklings.

He had separated twenty-three varieties of bacteria from the dejecta of eighteen children affected with different forms of summer diarrhœa, a description of which is given in a paper read by him before the Section on Diseases of Children of the Ninth International Medical Congress. He finds that the diarrhœal feces contain mostly a different bacterial vegetation from the healthy feces, having a much larger number of varieties than the latter.

During the past winter he has studied the changes perceptible to the naked eye and the microscope produced by these bacteria upon milk, and especially upon milk and bile mixed in different proportions. Bile does not apparently destroy the bacteria found in diarrhœal discharges, and cultures can be obtained from pure bile after being inoculated and kept for days in the thermostat. Some of the varieties of bacteria show diminished activity in milk when bile is added, others increased activity. In milk colored green by a large quantity of bile, or light yellow by a small quantity, one variety gives to the mixture a bright yellow color. This variety is found frequently in the diarrhœal feces. Some varieties give to the milk and bile mixtures a brown color, some a white or whitish-yellow, and one variety a gray color. Some of the varieties cause a disappearance of the oil globules in the milk, with a deposit of granular matter; some varieties do not affect them.

DR. L. EMMETT HOLT read a paper on

MICROSCOPIC EXAMINATION OF THE STOMACH AND INTESTINES IN THE SUMMER DIARRHŒA OF INFANTS.

The cases were divided into three classes, according to the duration of the disease. This in 82 fatal cases was as follows:

(1) Those lasting four days or less, 10 cases.
(2) Those lasting from four to ten days, 31 cases.
(3) Those lasting over ten days, 41 cases, or one-half

the whole number. The average duration of this class was about three weeks.

In the *first class* the microscopical examination was the least satisfactory. Post-mortem changes took place rapidly in the intestines in hot weather, and unless autopsies were made six hours after death, no significance could be attached to the alterations of the epithelium, which were almost the only changes.

In the *second class* there were found, with considerable uniformity, degenerative changes in the epithelium of the tubules of the intestine, those in the stomach being less constant. There was marked infiltration of the solitary follicles of the colon, and, to a less degree, of the small intestine, with similar changes in Peyer's patches. The solitary follicles had ruptured in many places, but there were no ulcers. There were no important changes in the submucous coat, except a sprinkling of new cells in its superficial portion.

In the *third class* well-marked lesions were found in the intestine, usually involving all the coats. Those in the colon, consisted of infiltration of the mucous membrane with new cells, in great numbers, obliterating many of the simple follicles; the submucous coat was crowded with round cells quite to the muscular coat, sometimes even invading this. There were superficial ulcers involving the mucous membrane only, and deeper ones reaching quite to the muscular coat, but none invading this coat had been met with. These were follicular in their origin. The most marked changes in the mucous membrane were found near these follicles. The lesions were not uniformly distributed, nearly healthy follicles being found quite near those which were completely disorganized.

In the large intestine, the cæcum, sigmoid flexure, and upper part of the rectum, were the portions in which the most advanced lesions were met with. In the small intestine the changes were usually limited to the lower part of the ileum, and were not nearly so marked as in the colon. Peyer's patches were swollen and often ruptured, but no ulcers of any moment had been seen about them, nor about the solitary follicles here. In a few instances patches of false membrane were seen in the colon.

The changes in the stomach in these protracted cases were not constant, there might be lesion of extensive gastritis, or the stomach might be almost normal.

The paper did not discuss the subject of the microorganisms found in the tissues. The writer's own investigations are as yet incomplete, and the reports of others are conflicting and indecisive. We can be pretty certain that at the end of three weeks lesions of a good deal of importance exist in the intestine. A glance at the size and depth of these follicular ulcers enables one to understand the chronic, rebellious course of these cases, the frequency of relapses, and the importance of local treatment by injections, if we would treat the lesion at all.

The paper was illustrated by a number of drawings, showing the various lesions of the disease.

DR. J. LEWIS SMITH said that, at his request, a well-known chemist had made a series of experiments for the purpose of ascertaining what effect, if any, the different germicidal agents now coming into vogue in the treatment of summer diarrhœa had on the process of digestion, and he said it was a point of some practical importance to know that these agents do not appear to retard digestion to any extent that would lead us to hesitate on this account to employ them.

DR. GEORGE B. FOWLER referred to the myriads of bacteria found in the intestines, and said that the pathological ferments are all organized, while the physiological forments are all unorganized. Still, the latter are fully capable of developing active poisons, as shown in the case of xanthin, etc. He had always regarded the gastric juice as possessed of valuable antiseptic properties, so that it stood on guard, as it were, to render more or less inert poisonous organisms entering the system by the mouth. Many high authorities also teach that the bile has an antiseptic value.

DR. A. CAILLÉ said that the practical outcome of the evening's discussion was about as follows: If we admit the bacterial origin of the summer diarrhœa of infants, we must admit that its principal cause is to be found in milk; and if this is acknowledged, we are forced to the conclusion that the ordinary methods of preparing and preserving milk are altogether faulty. At the February meeting of the Section on Pædiatrics, he had called attention to the apparatus devised by Dr. Soxhlet, of Munich, by means of which the preparing and feeding of sterilized milk can be carried out in any family. In his article on the subject Soxhlet said: "During the process of milking particles of manure and other forms of dirt get into the milk, and during transportation and general handling fermentation sets in; so that much of our milk is really unfit for consumption before it gets into the stomachs of infants and children. Mother's milk, on the contrary, is taken directly, and would undoubtedly be equally contaminated and frequently injurious to infants if it suffered the same manipulation."

Since the February meeting a New York firm, at his suggestion, had begun to manufacture and were now ready to supply an apparatus similar to that of Soxhlet, consisting of a tray holding ten feeding-bottles with combination stoppers, and a pot to boil them in. These, together with extra bottles, a tin dipper for warming the milk immediately before feeding, rubber nipples, and a cleansing brush are all packed in a box ready for transportation. In using the apparatus each bottle is filled to within one-half inch of its neck with the food prepared according to the age of the infant, and a perforated rubber stopper pressed well into the neck of the bottle. The bottles are then set in the tray, and the tray in the pot containing water up to the neck of the bottles, and the water is brought to the boiling point. After the water has boiled for ten minutes each bottle is hermetically closed by pressing a glass stopper down through the perforated rubber stopper. After the boiling has continued for ten minutes more the tray is lifted out and set aside to cool; after which it should be kept on ice or in a cool place until all the milk has been used. Milk prepared in this way can be kept sweet and pure for any required length of time.

The apparatus, Dr. Caillé went on to say, can be purchased for four dollars, but as this is probably too expensive for the poor, he would recommend that a mother unable to buy one should get six or eight bottles provided with the combination stopper, and boil the milk prepared for her infant in them.

DR. A. SEIBERT said that he had no doubt that the proceedings of this evening would constitute a stepping-

stone toward the attainment of a really scientific knowledge of the origin of summer diarrhœa. He was gratified to find that Professor Vaughan had also arrived at the same conclusion as himself, that 60° Fahrenheit is the boundary line beyond which the fermentation of milk commences.

DR. J. E. WEEKS said that a year ago he had made a series of experiments in regard to the action of different agents on the pus germ. He found that salicylate of sodium is inert, while salicylic acid is actively germicidal; and he believed, therefore, that Professor Vaughan was right in concluding that in his own experiments the salt becomes changed, and that its germicidal value is really due to the salicylic acid that is liberated. Naphthalin he found germicidal in rather strong solutions, while bichloride of mercury stands very high. Nitrate of silver also stands high.

PROF. VAUGHAN said that in his own experiments it was probable that the lactic acid present set some of the salicylic acid free from the sodium salicylate. In Dr. Weeks' experiments, there being no such agent present, the salt would naturally remain unchanged. As to the practical use of germicides in the treatment of summer diarrhœa, the dose of the bichloride of mercury required would be about one twenty-fifth of a grain, and as this seemed rather large for young infants, it would, no doubt, be safer to give five grains of salicylate of sodium, which was the dose of this agent required for the purpose desired.

The Chairman having inquired whether it is a fact, as supposed by some, that calomel becomes changed into the bichloride of mercury after being taken into the system, Dr. Vaughan replied that this is undoubtedly the case with a certain proportion of the amount taken, and it seemed probable to him that the change is especially likely to take place when the calomel is given in small doses.

NEWS ITEMS.

The Congress of American Physicians and Surgeons at Washington.—THE AMERICAN PHYSIOLOGICAL SOCIETY has issued the following preliminary list of papers to be read at the meeting to be held in Washington, D. C., on September 18, 19 and 20, 1888.

On the Therapeutic and Forensic Aspects of Hypnotism. By Dr. G. Stanley Hall.

On Enzymes Comparable with Papain, found in certain fruits of temperate climates. By Dr. G. L. Goodale.

On the Knee-jerk Phenomena. By Dr. H. P. Bowditch.

On the Nature of the Knee-jerk. By Dr. W. P. Lombard.

On the Effects of Varying Rates of Nerve Stimulation upon the Character of Muscular Movements. By Dr. H. P. Bowditch.

Growth and Death. By Dr. C. S. Minot.

The Cells of the Cortex Cerebri. By Dr. C. S. Minot.

The Uterus During Gestation. By Dr. C. S. Minot.

On the Temperature Limits of the Vitality of the Mammalian Heart. By Dr. H. N. Martin.

Histological Changes Produced in Ganglion Cells by Stimulation. By Dr. H. H. Donaldson.

On Fever. By Dr. Isaac Ott.

On the Distribution of Bacteria in Drinking Waters and Public Buildings. By Dr. W. T. Sedgwick.

The Origin and Regeneration of Blood Corpuscles. By Dr. W. H. Howell.

On Certain Ptomaines. By Dr. V. C. Vaughan.

On the Physiological Action of Uranium Salts. By Dr. R. H. Chittenden.

On Myosin and Certain of its Decomposition Products. By Dr. R. H. Chittenden.

On the Influence of Acetanilide or Antifebrin on Proteid Metabolism. By Dr. R. H. Chittenden.

THE AMERICAN CLIMATOLOGICAL SOCIETY announces the following programme:

The President's Address. By Dr. A. L. Loomis, of New York.

The Relation of High Altitudes to Germ Disease. By Dr. S. A. Fisk, of Colorado.

Is Climate an Etiological Factor in Graves' Disease? By Dr. R. G. Curtin, of Philadelphia.

An Environment Experiment Reported. By Dr. E. L. Trudeau, of Saranac Lake.

Definite Results Obtained by the Climatic Treatment of Disease. By Dr. A. Y. P. Garnett, of Washington.

Invalids Suited for Treatment at Colorado Springs. By Dr. S. E. Solly, of Colorado.

Influence of Semi-Tropical Latitudes on Types of Disease. By Dr. John Guitéras, of Charleston.

Discussion: The Relative Importance of Different Climatic Elements in Treatment of Phthisis. *Referee*, Dr. E. T. Bruen, of Philadelphia; *Co-Referee*, Dr. V. Y. Bowditch, of Boston.

Observations on the Use of Terebine. By Dr. D. M. Cammann, of New York.

Climate and Bright's Disease. By Dr. J. C. Wilson. of Philadelphia.

Discussion: The Mineral Waters of the United States; Therapeutic Value as Suggested by their Chemical Composition. By Dr. A. C. Peale, of Washington.

Their Therapeutic Value in Gastro-Hepatic Diseases. By Dr. Wm. Pepper, of Philadelphia.

In Urinary and Arthritic Diseases. By Dr. A. H. Smith, of New York.

In Malarial Diseases. By Dr. J. C. Van Bibber, of Baltimore.

Report on Mineral Springs. By Dr. C. C. Rice, Chairman, of New York.

Interpleural Pathological Products; their Cause, Significance, and Special Relationship to Pulmonary Phthisis. By Dr. J. R. Leaming, of New York.

Conditions which Tend to Render the Atmosphere of a Locality Aseptic. By Dr. J. T. Whittaker, of Cincinnati.

Discussion: Influence of Altitude on Cardiac and Pulmonary Diseases. *Referee*, Dr. F. Donaldson, Sr., of Baltimore; *Co-Referee*, Dr. J. J. Levick, of Philadelphia.

Climatic Characteristics of Texas. By Dr. Morse K. Taylor, U. S. A., of San Antonio.

Therapeutic Differences of Mountain and Sea Air. By Dr. W. H. Geddings, of Aiken.

Indications and Contra-indications for Altitude in Treatment of Phthisis. By Dr. F. I. Knight, of Boston.

Discussion of the Nasal and Neurotic Factors in Etiology of Asthma. *Referee*, Dr. F. H. Bosworth, of New York; *Co-Referee*, Dr. E. L. Shurly, of Detroit.

Therapy of Climate. By Dr. I. H. Platt, of Lakewood.

Therapy of Ocean Climate. By Dr. A. L. Gihon, U. S. N.

Climatic Characteristics of Roan Mountain, Eastern Tennessee. By C. J. Kenworthy, of Florida.

Notes of Summer in Switzerland. By Dr. D. B. St. John Roosa, of New York.

An Epidemic of Cerebro-Spinal Meningitis in Central New York. By Dr. W. T. Ford, of Utica.

Further Contributions to the Study of Consumption among the Indian. By Dr. W. Matthews, U. S. A.

The American Society of Microscopists will hold its next meeting at Columbus, Ohio, August 14, 1888.

The British Medical Association.—The fifty-sixth annual meeting of this Association will be held this year at Glasgow, on August 7th and three following days. The President-elect is Professor W. T. Gairdner, M.D., LL.D. The Address in Medicine will be delivered by Dr. Clifford Allbutt, of Leeds: the Address in Surgery by Sir G. H. B. Macleod, M.D.; and the Address in Physiology by Dr. J. G. M'Kendrick. A special address on "Recent Investigations in Surgery" will be given by Dr. W. Macewen.

Professsr Virchow.—The Emperor of Germany has conferred upon Professor Virchow the honor of the Red Eagle of the second class.

Medicine and Politics in Alsace.—By a decree of the Governor of the Department, the Société de Médicine de Strasburg has been dissolved; in other words, the authorization which is required by law for all meetings of more than twenty persons has been withdrawn. No reasons are given for this rigorous decision, and the disappearance of this venerable society has given rise to general expressions of regret.—*British Medical Journal*, May 26, 1888.

Fire in a Chemical Laboratory.—Fire in the laboratory of Dr. A. R. Leeds, of the Stevens Institute, Hoboken, N. J., recently caused damage to the extent of $5000.

An Anthropometric Laboratory.—Mr. Francis Galton has described his ideal of an anthropometric laboratory as a place where a person may have any of his various faculties measured, and where duplicaties of his measurements may be preserved as private documents. Besides the ordinary simpler apparatus, such an institution should contain instruments for psycho-physical research, for determining the efficiency of each of the various senses and certain mental constants. Instruction might be afforded to those who wish to make measurements at home, together with information about instruments and the registration of results. A library would contain works relating to the respective influences of heredity and nurture. It might also fulfil a welcome purpose as a receptacle for biographies and family records.—*Popular Science Monthly.*

Water Pollution a Thing of the Past.—The *Sanitary News* hopefully believes that with the cremation of garbage and precipitation of sewage, accomplished facts, water pollution will be a thing of the past.

Pharmaceutical Reform in Germany.—Revelations in a criminal trial at Strasburg last week disclose the prevalence of great abuses in the dispensing of drugs in at least one part of the Teutonic empire. In the late autumn of last year Dr. Flocken, a general practitioner, was in attendance on two patients suffering from rheumatoid arthritis, and in both cases, by some inexplicable mistake, he prescribed the extract instead of the tincture of colchicum. The unfortunate sufferers were thus made to take in each dose of this powerful depressant about ten times the maximum allowance, and they soon died of colchicum-poisoning. In both cases the prescription, in the absence of the apothecary, Greiner, was made up by his assistant, Wolf, and, without apparent misgiving, delivered to the messenger. Worse, however, is yet to follow. Dr. Flocken, on learning the fatal consequences of his ignorance or negligence, contrived to get back the prescriptions, destroyed them and the remainder of the medicines, of which he also got possession, removed the labels from the bottles, and in concert with Greiner, suppressed the prescription-book. For this a new book was substituted, and in it were entered the old prescriptions, all rewritten, including the two which prescribed the extract instead of the tincture of colchicum. After a two days' trial, Dr. Flocken, Greiner, and his assistant, Wolf, were all found guilty; the second assistant, Anders, being acquitted. Dr. Flocken was sentenced to six months' imprisonment, in which the month he had spent in prison before his trial was counted; Wolf, as the dispenser of the two fatal draughts, to three months; and Greiner, the master apothecary, who aided and abetted the falsifying of the prescription-book, to two weeks. Considering the gravity of the case, the sentences of the three are by no means too exemplary.—*Lancet*, May 26, 1888.

The "Moxie" Nerve Food.—The *American Analyst* for May 15, 1888, states that it has caused this preparation to be analyzed, finding it wholly inert. Publication of this fact resulted in a suit for damages by the proprietor of "Moxie," which was decided for the defendant, the plaintiff paying all costs.

Antiseptic Ammunition.—A useful suggestion is being carried out by the Netherland Government, by which provision will be made for supplying each soldier, during the time of war, with a cartridge containing some antiseptic dressings. Each cartridge will be made of convenient size, namely, about three inches in length, by two in width, and will be secured at one end with a safety pin. The dressing contained in each will consist of a bandage, about three yards long, and two pieces of gauze, all of which have been rendered antiseptic by a sublimate solution. Hence, in the event of wounds being received a ready means would be at hand for the immediate application of antiseptic dressings. Soldiers, in the case of slight injuries, would probably at once avail themselves of the dressings, and the latter could not fail to be of much use to the surgeons. The idea is well worthy of the attention of the military authorities in this country, and might even with advantage be adopted, as it has been for years past in the German army. In the wars in which, during the past few years, we have been engaged in tropical climates, the early application of antiseptics to the wounds received by the men was admitted to be a matter of the utmost importance by the

army medical officers attached to the forces.—*Medical Press*, May 9, 1888.

Adulteration of Cod-liver Oil.—Professor Peel, of St. Petersburg, reports an adulteration of cod-liver oil with fifty per cent. of mineral oil, and although it contained this large amount of mineral oil suspicion was not aroused by the appearance or taste. The stools of patients had the odor of petroleum, and this led to the discovery.—*American Journal of Pharmacy*, May, 1888.

Antidotes for Poisons.—The *American Journal of Pharmacy* for May, 1888, writes that a general antidote for poisons is a mixture composed of equal parts of calcined magnesia, wood charcoal, and hydrated oxide of iron, with a sufficient quantity of water. It is, as a harmless and simple remedy, applicable in such cases when the nature of the poison is unknown.

As an antidote for iodoform, BEHRING recommends a twenty per cent. solution of bicarbonate of sodium.

Imagination in Men and Women.—An interesting experiment was made by Dr. Durand, in reference to the relative power of imagination in the two sexes. He gave to one hundred of his hospital patients a dose of sweetened water, and shortly afterward entered the room, apparently greatly agitated, saying he had by mistake administered a powerful emetic. In a few minutes four-fifths of the subjects were affected by the supposed emetic, and were mainly men, while every one of those not affected were women.—*The Popular Science Monthly*, June, 1888.

Season and Disease.—While it appears from the records of English health officers that some diseases have special seasons in which they are most likely to prevail, it is not shown that occasional variations in temperature have much influence in the matter. Scarlet fever is at its minimum from January to May, and at its maximum in October and November. Diphtheria is more evenly distributed through the year, and is most dangerous a little later than scarlet fever. Measles and whooping-cough seem to be somewhat aggravated by cold weather, but are most fatal in May and June. Hot weather is adverse to smallpox, and favorable to disorders of the bowels, particularly in children.—*The Popular Science Monthly*, June, 1888.

Medical Education in England.—A committee of the English Medical Council has been appointed to consider the best means of increasing the practical element in medical education. Although the strictly scientific parts of medicine are taught as they never have been taught before, it is conceded that there has been a falling off in the practical part, and that the new graduate, although more learned in minute anatomy, chemistry, and physiology than his predecessors, is less apt at recognizing and treating common diseases.—*The Popular Science Monthly*, June, 1888.

Chocolate Chewing Gum and Paraffine.—Two confectioners in Glasgow have been fined £3 each, under the Adulteration of Foods Act, for selling a sweetmeat called chocolate chewing gum, and containing 42 per cent. of paraffine wax. It was stated for the respondents that the confection was manufactured in Lincoln, and that it was bought by children for the purpose of chewing and then making crackers. Dr. Russell stated that the paraffine wax was insoluble in any of the fluids, and indigestible, and might so irritate the stomach as to cause convulsions in children of tender years. The sheriff said the article had a misleading name, and as children might purchase it for eating, the trade must be put down.—*British Medical Journal*, April 21, 1888.

An Explanation.—Messrs. Wm. R. Warner & Co., request us to state that they have no connection with the firm of H. H. Warner & Co., of Rochester, who make "Safe Remedies" and other patent medicines.

NOTES AND QUERIES.

THE MODIFIED LITHOTOMY STAFF.

To the Editor of THE MEDICAL NEWS,

SIR: Referring to the communication of Nathan R. Smith, M.D., of Baltimore Md., May 7, 1888, in your issue of the 12th inst., I desire to state that in 1877 I assisted at an operation for lithotomy successfully performed by Professor Alan P. Smith (son of the late Professor Nathan R. Smith) upon a Justice of the United States Supreme Court, the grooved lithotomy staff, devised by Professor Nathan R. Smith, being used.

Professor Smith's lithotomy staff is the instrument *par excellence*—the operator having entered the point of his knife in the groove of the staff may proceed with mathematical certainty to the bladder. The staff was first used many years ago by Professor Nathan R. Smith.

Yours, respectfully,

SOLON B. STONE,
A. A. Surgeon U. S. Army.

POST HOSPITAL, FORT MISSOULA, M. T.,
May 28, 1888.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF THE MEDICAL CORPS OF THE U. S. NAVY, FOR THE WEEK ENDING JUNE 2, 1888.

CRAIG, F. C., *Passed Assistant Surgeon.*—Detached from Naval Hospital at Norfolk, and ordered to the Naval Hospital at New York

WENTWORTH, A. R., *Assistant Surgeon.*—Detached from U. S. S. "Galena," and ordered to the Naval Hospital at Norfolk.

OFFICIAL LIST OF CHANGES OF STATIONS AND DUTIES OF MEDICAL OFFICERS OF THE U. S. MARINE-HOSPITAL SERVICE, FOR THE WEEK ENDING JUNE 2, 1888.

DEVAN, S. C., *Passed Assistant Surgeon.*—Granted leave of absence for ten days, May 29, 1888.

CARRINGTON, P. M., *Passed Assistant Surgeon.*—Granted leave of absence for five days, May 29, 1888.

THE MEDICAL NEWS *will be pleased to receive early intelligence of local events of general medical interest, or of matters which it is desirable to bring to the notice of the profession.*

Local papers containing reports or news items should be marked.

Letters, whether written for publication or private information, must be authenticated by the names and addresses of their writers—of course not necessarily for publication.

All communications relating to the editorial department of the NEWS *should be addressed to No. 1004 Walnut Street, Philadelphia.*